For the Pattison Prize in Clinical Surgery.

A SERIES OF SIX CASES OF CARCINOMA
OF THE COLON - WITH A SHORT DISCUSSION
ON EACH AND A COMMENTARY AT THE END
OF THE SERIES.

Spring 1929

J.A.P. Cameron.
Name: James Innes.
Age: 66 years.
Occupation: Baker.
Address: 9 Monktonhall Terrace, Musselburgh.
Married.
Date of Admission: 31/1/29 - Ward 13.
Recommended by Dr. Cieiland, 22 Bridge St., Musselburgh.
Diagnosis: Acute Obstruction of the Large Bowel.
Acenocardinomatous Stricture of the Pelvic Colon.
Complaint: Blockage of the bowels - duration 2 days.
Vomiting.
Increasing constipation - for 1 year.

History.

Eight years ago the patient had Typhoid Fever which kept him in bed for 6 months. After this illness the patient was perfectly well until June 1928, when one day at his work he became dizzy and had to go home to bed. After this he noticed that his motions were black for a day or two. His sister gave him castor oil, but he vomited this up. He then tried a second dose a few hours later and this produced a good motion. Soon he went away for a fortnight's holiday and felt better during this time, only he noticed that he was becoming more constipated and had
to take opening medicine. Previous to this he had not been troubled with constipation. On one occasion he again had an attack of dizziness and had to hold on to someone to prevent himself from falling. Again he noticed that his motions were darkly coloured after it. Often he would be troubled with wind and 'rumblings' but there was not much distension.

Since this holiday he has been working and in quite good health except for the increasing constipation. He has had no attacks of diarrhoea but he noticed that the shape of his stools was 'like that of a child' and sometimes accompanied by mucus but no visible blood.

On the night before admission he went to bed as usual and when he woke up in the morning he was sick and felt there was some blockage in his bowels as his abdomen was greatly distended. He had a colicky pain situated in the right lumbar region which did not radiate round the abdomen. The vomiting was quite independent of the pain and occurred about every 2 hours. He first brought up food previously taken and this was followed by brownish foul smelling material with a disagreeable taste. The rumblings in his stomach have been getting worse and he has got increasingly distended.
The patient remained in bed and was given castor oil. Then the nurse gave him an enema, which did not help him much and he was sent into hospital not having passed a motion or flatus for 2 days.

Lately the patient has been losing weight and strength. He thinks that on one occasion about 1 month ago he passed a little blood. He is not suffering from piles. There has been no history of any lump rising, or movement felt in the abdomen.

Previous Health: Typhoid Fever 8 years ago - duration 8 months. Measles and Scarlet Fever when young.

Social History: The shop in which he works is very healthy and of modern design. The home conditions are good.

Family History: Mother and Father both dead. Mother died of some bowel condition. Father died of a 'stroke'. Wife is well. Has 2 daughters - one complains of her bowels occasionally. One son who is in good health.

Physical Examination:

The patient is an old man in an active state. He has the appearance of slight loss of flesh. His face is rather drawn and his eyes a little hollow. Colour is pale and slightly greyish.

Pupils: Equal and react normally.
Tongue: Dry with a brownish fur. The breath is foetid and disagreeable.

Teeth: All missing. Has upper and lower dentures.

Abdomen: Moderately well nourished, though there is some loss of subcutaneous tissue. The skin has lost some of its elasticity. Abdomen moves freely with respiration. There are one or two De. Morgan spots here and there. On admission there was considerable distension in the region of the large bowel in both flanks. There was an enormous rounded prominence in the right iliac fossa and fullness in the epigastrium. The prominence on the left side was less marked. Marked splashing could be elicited in the right iliac fossa. No visible peristalsis could be noted. No superficial or deep hyperaesthesia. No tenderness or rigidity. Slight diminution of liver dullness.

On examination a day or two after blind caecostomy was performed there was a fullness in the epigastrium and down the left side. On deep palpation there was something indefinite felt in the left iliac fossa. No tenderness but slight rigidity of the left Rectus muscle. The umbilicus was quite free. No splashing could be elicited in the stomach. Spleen not enlarged and no free fluid in the abdomen.

Per Rectum: The Rectum was empty and slightly balloon- ed. Prostate normal. Nothing else felt.
Ho Haemorrhoids.

Heart and Lungs: N.A.D.
Temperature = 98°. Pulse rate 88.
Respirations 22.

Legs: There are some varicose veins in the legs.

Urine: Contained no abnormal constituents.

Faeces: Benzidine Test - faintly positive.

Provisional Diagnosis: Acute Intestinal Obstruction of the Large Bowel.

Treatment:
Operation to relieve the symptoms and acute condition:

Date: 31.1.29. Performed by Mr. Cochrane.
Scopolamine 1/100 gr. Morphia 1/4 gr. given hypodermically before the operation. Local Anaesthetic = 1/2% Novacaine.

A small grid-iron incision was made in the right Iliac fossa down to the peritoneum. The distended wall of the Caecum located and sutured to the peritoneum by means of a single linen purse-string suture. The extremities of the wound were then approximated with silk worm gut sutures and the Ext. Oblique sutured to the skin in the centre leaving a Channel to the Caecum. The Caecum was then opened by means of a thin bladed...
pointed knife and a large quantity of faecal material evacuated. A small rubber tube was pushed into the caecum and fixed to the skin by a silk worm gut suture. The wound was packed with Iodoform gauze.

**Summary:** Obstruction to large intestine. 'Blind' Caecostomy.

**Progress Notes:**

The Caecostomy tube worked quite well whilst in the theatre but after that it did not work well. He was given castor oil and an enema on 2:2:29, but this did not produce a very good result. On the day after however castor oil and an enema resulted in two very good motions. The large bowel was still somewhat distended.

A Barium Enema was given: The enema flowed with difficulty as far as the Splenic flexure but no Barium could be got beyond this point.

**Preparation for Second Operation to relieve the cause of the Obstruction.**

The Bowel was cleared out as thoroughly as possible with enemata and cascara as marked on the accompanying chart. Castor oil was given four days before the operation and then only enemata were administered. The last enema being on the morning before the operation.

**Diet:** Consisted of ordinary light food with as little
THE ROYAL INFIRMARY OF EDINBURGH.

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residue as possible.

Vaccines: Used to raise the patient's resistance to infection.

1st Injection = 10 million Streptococci) given on 19:2:29
50 million B. Coli (3 days before operation).

Blood Count:- 19:2:29 W.B.C.'s. 7000 = Hb. 85%
21:2:29 = 5 cc. of 5% Nuclemic Acid given intramuscularly.

Heroin 1/12 gr. given at 4.15a.m. on morning of operation.

Pre-Operative Note:

When the patient was admitted to hospital he had the clinical symptoms indicative of a carcinoma in the distal colon but the Barium enema x-ray photo gave a picture which strongly suggested that the carcinoma was in the Transverse colon close to the Splenic flexure.

Atropine 1/100 gr. given hypodermically 1 hour before the operation.

Operation = Date: 22:2:29 Performed by Professor Wilkie.

Anaesthetic = Ethyl Chloride and Ether.

An oblique incision on the left side parallel to the costal nerves was made. The muscles were pulled
apart. On opening into the peritoneal cavity the Splenic flexure appeared to be normal. The hand then followed down the descending colon until the tumour was located at the junction of the proximal and distal third of the pelvic colon - a typical ring stricture. The proximal part of the colon was mobilized by cutting through the peritoneum along the lateral side. The growth was then pulled out and the rest of the intestines packed off. The colon was held up so as to be able to see the vessels running in the mesentry. The suitable vessels were ligated and the bowel dealt with. Below the growth the Taeniae and muscular coats all round were cut through. (The thickest band of the pelvic colon is that which is next to the mesentery and when it is divided it springs apart).

Two Shoemaker's clamps were applied and the bowel divided between with a knife dipped in pure carbolic. The same was done above the growth, two other clamps being applied and the bowel divided with the knife re-dipped in carbolic. 7" of the colon was removed. As the colon was freely mobile the two ends were neatly brought together, the clamps being side by side and an end to end anastomosis performed, using one layer of silk sutures. Since the muscular coats had been divided there was no tension at the line of antastomosis. The rent in the mesocolon was then
closed and some of it was laid over the bare part of the peritoneum to prevent future adhesions. The wound was then closed in layers. The growth appeared to be very fibrous and scirrhous in type. The only glands which felt enlarged, were the immediate paracolic glands and there was no evidence of distant metastases. The ultimate prognosis should therefore be fairly good.

**Summary:** String-stricture Carcinoma of the Pelvic colon.

Resection of bowel = End-to-end anastomosis.

**Post Operative Treatment:**

Progress Notes:

Blocks were put at the foot of the bed till the patient was properly out of the anaesthetic. There was no sickness but some slight pain was felt across the abdomen from flatulence. Slept well the following night - Heroin 1/12 gr. given at 3.10a.m. A fluid diet was given for two days and then gradually a light diet with little residue. No fluids were given subcutaneously. A tablespoonful of Petrolagar (without Phenolphthalein) was given on the second day after the operation and this was continued for four or five days B.i.d. No purgative was given and no enemata - the bowel being kept at rest as much as possible.
24:2:29 - First bowel motion.


26:2:29 - Slight pain felt in the wound on the left side. Also a little pain felt due to wind.


6:3:29 - Stitches out. Wound satisfactory.

The chief features to note in the history of the patient are - that he is a man past middle age, having been previously quite well and then gradually became more and more constipated. In June he had the first attack of obstruction which cleared up. There was evidence of blood being passed in the motions. Wind and borborygi. Later on a sudden acute attack of obstruction occurred in the night, (It is interesting to know why these acute attacks come on so frequently during the night - the same phenomenon is observed in acute appendicitis cases and also in case of enlarged prostate. It has been stated that the increase of CO₂ in the blood during sleep causes unstripped muscle fibres to be more irritable and they are sent into contraction), Colicky pain in the right lumbar region. Vomiting becoming foul in nature. Increasing distension of the abdomen. Loss of weight and strength. It is evident from this that the condition is following upon a definite course of events taking place within the bowel - the lesion is of the constricting type. The clinical manifestations began over a year ago and it is quite probably that the actual growth was there some months before that. From the mere inspection of the patient alone on being admitted to hospital one was fairly justified in suspecting that the condition

Discussion of Case I.
was an acute obstruction of the Colon following upon a chronic obstructive condition, since the bowel was so visibly hypertrophied and dilated in both flanks over the site for the large bowel. No visible peristalsis however was seen. Diarrhoea was not present though mucus was passed several times. When there is an existing constriction in the lumen of the bowel, the patient is very susceptible to an acute attack of obstruction. A hard lump of faeces plugging the lumen or a dose of castor oil which sets up hyperaemia and oedema in the bowel are frequent causes. In this case there was no certain cause for the onset of the acute obstruction. The acute attack failed to pass off as it did in the previous attack and operative relief was the only resort.

In the physical examination one was struck with the enormous distension of the colon and the immediate danger which would ensue if one were to make an exploratory laparotomy. The presence of De Morgan's spots is interesting as it was once thought that they were associated with malignant disease. They have been present in numerous cases of intestinal tumours which I have met with.

Pathology Report: Specimen.

A typical string-strictures adenocarcinoma of the pelvic colon. There are one or two glands in the
Specimen

Adenocarcinomatous Stricture of the Pelvic Colon

A = Stricture.

B = Lumen of Bowel.

C = Mesentery.

D = Fat.

E = Adenocarcinomatous Nodules.

Low Power.

High Power.
mesentery close to the tumour which are enlarged and hard as a result of secondary malignant deposits. A small bunch of carcinomatous nodules can be seen on the outside of the bowel along the line of stricture. **Microscopic Section:**

Shows typical adenocarcinomatous infiltration. Portions of the glandular element are completely shut off from the surface and the nuclei are large and darkly staining.

The evident loss of weight as shown by the loss of subcutaneous tissue is a characteristic only found in advanced cases. The diagnosis of the condition is arrived at by taking a careful history and noting the change in bowel habits from regular to irregular. The clinical picture developed along the lines of a stenotic lesion with the physical signs and symptoms of wind, borborygmi, colicky pains, increasing distension especially of the caecum and constipation. Examination of the faeces showed a trace of blood by a faintly positive Benzidine Test. The Rectum was found to be ballooned on examination probably due to a disturbance in the nervous mechanism of the part as a result of a tumour growth higher up. The altered shape of the stools is not of much significance in the diagnosis. Sigmoidoscopy was not employed in this case. The Barium Enema here seemed to flow as far as
the splenic flexure but there was a suspicious looking area in the photo of a stricture lower down in the pelvic colon.

In this case, we could locate the obstruction to the colon but its situation therein was indefinite. The chance is 9 to 1 of the cause being a malignant one and a 6 to 1 chance of its being situated on the left side. In very severe cases, as this one was on admission - with faecal vomiting and having failed to relieve with enemata, 'blind' caecostomy done under local anaesthetic is the method of choice. The danger of temporizing is that of gangrene of the Caecum which bears the brunt of the increased intestinal tension. The method of Caecostomy used was that in which the caecal wall is stitched to the peritoneum without bringing it out of the wound and a small sharp knife is pushed into the caecum. Then a small tube is put in for drainage but this is not the same as the valvular type of tube drainage and the tube frequently comes out the next day. There is more soiling of the dressings caused by this method and this makes the patient uncomfortable. There is less danger however of rupture of the caecum by manipulation. After this relief to the abdomen the patient felt more comfortable and time was allowed to make further examination to find out the exact cause and
site of the obstruction. The bowel was cleared out as well as possible by means of enemata and castor oil. The last enema being given on the morning before the operation. Vaccine therapy was begun - the first injection being given 10 days before and the second 3 days before the second operation. This treatment has been found to be of value in raising the resistance of the patient to infection which might be incurred at the operation. 5cc. of 5% Nuclei was also given to raise the leucocyte count - the night before the operation.

Operation:

The important part of the operation is to obtain free mobilization of the colon. By cutting the taeniae and muscular coats of the bowel all round - the tension on the suturing line is relieved and end-to-end anastomosis efficiently performed. There were no signs of any remote secondary metastases and only the glands in the immediate neighbourhood were involved.

The bowels were kept loose by means of liquid paraffin; It was found better here to increase the diet slowly and not to try to get a motion of the bowels till the 6th day after the operation.

The only slight complication which was met with was a mild infection of the abdominal wound which
cleared up quickly.

The prognosis in such a case is good and the patient may live for several years. The danger of a recurrence is slight.
CASE II.

Name: James Graham.

Age: 57 years.

Occupation: Post office engineer.

Address: 39, Dalmeny Street, Leith.

Date of Admission: 18/2/29.

Recommended by:- Dr. Gardner, 74, Pilrig Street, Leith.

Diagnosis: Adenocarcinomatous growth in the Proximal Colon involving Caecum and proximal end of ascending Colon.

Complaint: Rumblings in the right Iliac Fossa - duration 18 months. Loss of weight, Tiredness, Anaemia.

History.

About 18 months ago the patient became aware of gurgling noises in his right Iliac Fossa. These were constantly present day and night and he began to rift a good deal of wind. He was bothered with flatus but not to the same extent. He never felt distended at any time. These rumblings were generally more pronounced after taking liquid food. He actually noticed that on pressing into the right Iliac Fossa in the region of the borborygmi he caused a dull pain and although he felt no actual lump he imagined...
that there was something there which should not have been present. There was also a feeling as if fluid were trying to pass to and fro across the epigastrium. There was no history of any visible movements.

About this time the patient complained of indigestion, a thing which he had never been bothered with before. It took the form of a sensation of something rising up in the epigastrium and causing considerable discomfort. It was not related to taking food and was relieved a little by eructating. No heart burn or water brash was present. He felt weaker and more easily tired and had no inclination for food.

The patient went away for a holiday and felt a little better. He then had his teeth removed but no great improvement followed this. In 1927 he met with a motor accident when he was severely bruised and his condition began to go back after this. He was off work and says he lost about 3 stones in 14 days. His doctor treated him for anaemia and indigestion, and he was put on a strict diet. Later he had a Barium meal and Test meal taken in the Royal Infirmary Edinburgh and nothing abnormal was found in the stomach. Then he went away for a long holiday during the summer and his condition improved considerably. His appetite became better and he regained some strength,
though this did not come up to his former standard and he was able to start work in September. All the time however the rumblings went on, but there was never any constipation or diarrhoea.

In October the patient had a Barium Enema done and some obstruction in the Caecum was observed. He was advised to get something done about it but instead he put it off and continued work. Since then he has felt moderately well, being now about a stone heavier than he was in August.

His bowels have always been regular but he thinks he would have been constipated if he had not taken plenty of fruit. This gave him an easy motion and he has only occasionally required to take medicine. He has never noticed any change in the colour of his motions except when he was taking Iron, when they were apt to be foul smelling. No history of haemorrhoids. The appetite is still rather poor in the morning but he always manages to eat good meals during the rest of the day. Flatulence has not been so marked lately.

**Previous History:** Typhoid Fever in 1896.

Scarlet Fever and Nephritis at the age of 11 years.

**Social History:** He sometimes has to work in damp places. His own house is good and healthy.
Family History: Mother and Father both dead - quite healthy while they were alive. Brother and Sister both alive and well

Habits: Takes some beer now and then. Smokes to a moderate extent.

Physical Examination:

The patient is a tall well built man, very anaemic looking and with a decided tinge of yellow in his skin. His cheek bones are slightly prominent and he looks as if he had lost weight.

Pupils: Equal and react normally.

Tongue: Moist, but has a generalised white fur over it.

Teeth: Upper and Lower dentures.

Abdomen: The skin is lax but still contains some fat. Loss of flesh is evident to a certain extent. The abdomen is flat and moves normally with respiration. No definite distension. During the examination rumblings were heard in the Right Iliac Fossa. No superficial or deep hyperaesthesia. On deep palpation there is a definite mobile mass in the Right Iliac fossa situated just medial and partially above the Anterior Superior Iliac spine. It can be gripped with the fingers and is about 3" long and 2" broad. It is of hard consistence, irregular in shape and has a nodular surface. It is dull on percussion and freely movable in the peritoneal cavity in all
directions over a limited range. Whilst examining the gurgling of the passage of fluid through the mass was felt, and easily heard on auscultation. There was slight splashing in the lower end of the ileum. No free fluid in the abdomen. The lower border of the liver was just palpable, smooth and regular. No enlargement of the Spleen. No renal tenderness. Nil else abnormal to note.

Circulatory System:

Pulse: vessel wall healthy. Volume and tension a little diminished, Rate 84.

Heart: 1st Mitral a little impure. Other sounds pure.

Respiratory System:— No cough. No abnormality.

Urine: Contains no abnormal constituents.

Knee Jerks: Quite active.


No lesion could be detected in the stomach or duodenum. Peristaltic waves were well seen and passed evenly to the pylorus. It would appear that even early gastric neoplasm could be excluded.

After 6 hours:

No gastric residue. There is an irregular appearance of the terminal Ileum and tip of the Caecum which reproduced that found at previous examination sufficiently constantly, to be strongly indicative
of a neoplasm in this region.

After 24 hours:

Barium throughout the Colon which is well formed, there being however slight redundancy of the Transverse Colon. There is a mass of calcified glands in the left side opposite the 4th lumbar vertebra.


Enema showed an irregular filling defect in the end of the caecum with marked patency of the Ilio Caecal valve.

Conclusion: This, with the preceeding examination render the diagnosis of neoplasm in this region highly probable.

Barium Enema: 19:2:29

Further enema shows free flow of barium to distal portion of ascending colon. The Caecum could not be outlined.

Treatment - Operation.

Pre-Operative Preparation and Note.

Dose of Castor Oil given 48 hours before the operation. One or two enemata (soap and water) the same night. Next day very light diet. On the night before operation, enemata to clear out the colon. Saline at 7a.m. on the morning of the operation.

Vaccine Treatment:- 19:2:29 - 10 mil. Streptococci  
50 mil. B. Coli
R.B.C's. - 2,800,000 Hb. 40%.

W.B.C's. - 5,300.

21:2:29 5c.c. 5% Nucleinie Acid given.

22:2:29 W.B.C's. - 10,000.

Operation: 22:2:29. Performed by Professor Wilkie

Anaesthetic: Twilight Sleep - Scopolamine 1/100 gr. and Morphine 1/4 gr. (1 1/2 hrs. before) Scopolamine 1/200 gr. and Morphine 1/6 gr. (1/2 hour before).

Spinal Anaesthetic: (0.7c.c. of 10% Stovaine in Glucose).

Choice of Incisions: Paramedial or Right lateral Oblique. Oblique incision in the right iliac fossa and right lumbar region was made. The three layers of muscles - External and Internal Obliques and Transversus were divided and the peritoneum opened. A large tumour was felt in the caeco-colic region - The growth was estimated and the extent of the metastases. Enlarged glands were felt along the right colic vessels. No peritoneal metastases. The liver was freed and it was decided that the growth was obviously removable. The rest of the intestines were then packed off. The Caecum, ascending Colon and Hepatic Flexure were mobilized by dividing the peritoneum and subjacent fibrous tissue with the scissors,
the Colon being pulled over to the left. The Spermatic vessels and second part of the Duodenum were then seen and freed from the colon and its mesentery. The duodenum and kidney were packed away from the Colon. The Colon was held up to the light and the vessels in the mesocolon, right colic and ilio colic, were ligated. The Transverse colon 2" beyond the Hepatic flexure and Ileum 8" from the ilio-caecal valve were treated by the 'cuff' method, ligated and invaginated. The closed ends were brought along side ready for suture with continuous silk Lembert sutures. The peritoneal and muscular coats were divided on either side. A stout silk suture was passed in with a straight needle subjacent to these two denuded areas to act as a cutting thread. A continuous silk Lembert suture was then put in covering this area and before its completion, an endeavour was made by means of the cutting thread to divide the submucous and mucous coats. It failed however through snapping. The second Lembert suture was accordingly loosened and with scissors the inner coats of the two portions of the bowel were divided. The Lembert suture was then completed and some loose fatty tissue laid over the line of anastomosis. The rent in the mesentery was then closed and the anastomosis laid back in the raw area. The wound was closed in layers with a
small rubber dam drain in the fibrous tissue.

**Summary:** Cancer of the proximal Colon: Resection and Lateral Anastomosis.

**Post-Operative Treatment:**

The patient was taken back to bed carefully, keeping the head as low as possible. Blocks were put under the foot of the bed for 24 hours. Then level for 6 hours. After that the patient was raised by pillows under the head for draining purposes. 1/12 gr. Heroin given the night after the operation. The patient was not sick after the operation. For two days he got a fluid diet without milk. There was not much flatulence. 1 tablespoonful of Liquid paraffin was given the night after the operation and continued B.i.d. for 2 days. As the bowels became too loose this had to be stopped for the time being. The patient's condition was very good after the operation and continued to make steady progress.

25:2:29 - Bowels moved twice for the first time since operation.

3:3:29 - Bowels settled down. Excellent progress.

Feels much better. Drain removed on the 1:3:29.

7:3:29 - Stout given. Wound satisfactory.

Stitches out.

10:3:29 - Discharged feeling very well.
Discussion on Case 2.

The appearance of the patient is at first striking - He is pale has a yellowish tinge and is obviously suffering from anaemia. The history which he gives corroborates with his outward appearance for he feels weak and gets easily tired - the result of anaemia and toxic absorption. Gurgling noises are a feature in this case while the alteration in the bowel habits is not evident. When we consider the special functions of the different portions of the alimentary canal it is possible to explain the symptoms and signs which the patient shows. Anaemia, the result of toxic absorption from the proximal colon and gurgling noises due to the fluid or semi-fluid contents being forced through a constricted part of the proximal colon. It is owing to the fact that the contents of the proximal colon are so fluid that signs and symptoms are so late in appearing. The patient first complained of indigestion, then anaemia became evident. The probability is however that the constricting process going on in the bowel had been there for some time, without giving any information of its presence. It is true that the fungating type of growth is not so slow growing as the scirrhous type. It is remarkable how long a patient will go on with these vague symptoms without ever suspecting that the origin
of the trouble is in the proximal colon. The rumbling noises first drew the attention of this man to a lump which he felt in his right lumbar region. We know from experience which areas in the proximal colon are most likely to give rise to certain symptoms and so it was presumed since the history of the case was so long as 18 months that the tumour had extended down from the caeco-colic sphincter to the lower end of the caecum. Diarrhoea especially mucous diarrhoea was not complained of, though it sometimes is, as a result of ulceration of the growth. The Benzidine Test for blood in the stools was only faintly positive on one occasion.

An important point in the physical examination of the abdomen was the fact that the tumour could be gripped and rolled between the fingers without causing any pain. In other cases of the same nature where pain had been experienced it was found that the adjacent peritoneum was becoming involved in the growth. The peritoneum was not invaded in this case when the operation was performed. The diagnosis in such a case as this was comparatively simple - in the presence of the marked anaemia and absence of any other conditions which might cause a similar anaemia - a negative Rectal examination and a healthy stomach as shown by the radiogram. The gurgling noises, pal-
Case II
Graham.

ADENOCARCINOMA OF CECUM

A. = Cut surface of growth.
B. = 'Mulberry-like' papilloma.
C. = Papilloma with long stalk.
D. = Neum.
E. = Appendix.
F. = Mesentary.
G. = Colico-cecal opening.
pable tumour in the right lumbar region, and Barium Enema confirmed the diagnosis. Hyperplastic Tuberculosis which is quite commonly found in the proximal colon and caecum is the only condition which might cause some difficulty in the diagnosis but we ruled this possibility out by noting the history carefully and by the absence of any other signs of Tuberculosis.

Pathology of the Tumour.

Cancer of the colon is invariably an adeno-carcinoma. Here we found a typical adenocarcinoma showing infiltration. The colour of the interior of the caecum and ascending colon is brownish red. The growth is situated about the middle of the caecum and extends down below the level of the ilio caecal valve. In the upper half of the caecum and adjoining Colon there are several papillomata showing perfectly regular formation. Some are sessile and others have a pedicle. At one point the adeno-carcinoma is invading a papilloma which seems to be showing malignant change. There is an abundance of fat over the Caecum and spreading out into the mesentery. It is a question whether the tumour has originated from a malignant change in one of these papillomata or these papillomata are incidental and the adeno-carcinoma has spread into one of them.

As in this case the history was rather long, it
was expected that the glandular involvement would be fairly extensive but actually it was not. Since this area of the bowel is highly absorptive the glandular metastasis is always more extensive and occurs at an earlier date than in the distal colon.

Owing to the moderate "avirulence" of colon tumours and because the liver and kidney were in good functional condition, the liver showing no signs of metastases it was decided to perform a resection. The patient was well prepared for the operation the bowels being cleared out by means of Castor Oil and enemata - Vaccine therapy was again employed to raise the resistance to infection and 5cc. 5% Nuclein was given to raise the white blood count. The patient's reaction was very good - W.B.C's. rising from 5300 to 10,000. Spinal anaesthesia was tried but unfortunately did not prove very successful and other methods had to be tried. As regards the Operation - free mobilization of the Colon is again the chief point. All tension on the suture lines of the bowel was relieved by doing the 'cuff' method. This aim of relieving all tension at the line of anastomosis is often aided by making a caecostomy opening as well, but this was not deemed necessary here.

A new method of cutting through the mucous membrane by means of a silk suture was attempted but failed owing to the breaking of the suture material.
This method in theory looks excellent but very few silk sutures will stand up to a sawing action without breaking. Silver wire may be used through which a diathermy current can be passed.

The patient was returned to bed after the operation with care, seeing that the head was kept low. Since no colostomy opening was made the patient was kept on fluids without milk and with as little residue as possible. Subcutaneous salines were not necessary and as the bowels were rather loose the liquid paraffin had to be reduced. The drain which was put into the subcutaneous tissues was removed on the 8th day after the operations when the wound was dressed.

Prognosis: There is a guarded prognosis immediately after the operation but later there is a good hope of recovery.
CASE III.

Name: Robert MacCallum.

Age: 60 years.

Address: 27 Centre Street, Kelty.

Occupation: Miner.

Recommended by Dr. Keay, Rosskeen, Kelty.


Diagnosis: Adenocarcinoma of the Iliac Colon invading the Abdominal Wall.

Complaint: Attacks of colicky abdominal pains - duration 3/12. Rumbling noises across his abdomen - for 14 weeks. Increasing constipation for 3 weeks. Sickness for 3 days.

History:

Until December 1928 the patient was in good health but then he began to feel that his work was getting too much for him. He would feel tired and exhausted. At the end of his work he would feel gripping pains round about his umbilicus and he found that he could not get relief by lying on his back and then twisting over to one side when he got rid of wind.

About the middle of December he caught a chill which seemed to make his condition worse and the pain became severe - radiating across the abdomen and down into the scrotum but not down the thighs. It
was colicky and clawing in character and not related to the taking of food. He noticed a gurgling sensation in the right lumbar region and says he could feel wind travelling across the abdomen with the pain. He volunteers that he felt as if the pain were working away trying to move something, then he would feel a sudden rush as if wind had passed through the obstacle. This would be followed by gurgling noises and after passing flatus the pain would be less severe. The patient had to stop work and rest a good deal at home but he felt easier if he moved about quietly in the house. He has never been troubled with his bowels, having a motion regularly every day. There has been no diarrhoea and no distension. This attack lasted about 2 weeks and his doctor put him on a light diet consisting mainly of fish and milk puddings. He found that this diet made him rather constipated. After 5 weeks he got a light job and felt quite fit, although he still had occasional slight pain. Soon he was put back on to his previous heavy work which was wet and cold and this brought on another attack with the same syndrome of symptoms as before but on this occasion they were not so severe.

He has never been troubled with indigestion and has not had any post-prandial discomfort. He thinks
he was losing weight while working towards the end, but since being off work he feels that he has put on weight. He has always had a good appetite but a few days before admission he took a dose of castor oil which he brought up again almost as soon as he took it and since then he vomits any food which he takes. Never any jaundice or trouble with micturition. His bowels opened 5 days ago, then a little yesterday and today and some flatus was passed at the same time.

The patient was sent in as a case of Subacute obstruction. There is no history of any diarrhoea or anything abnormal with the motions. He has had bleeding piles for years which become irritable at times but have not bothered him for some time.

(The patient volunteers his history with difficulty).

Previous Health: Always healthy.

He has had 2 pit accidents - one to his back when he was 3 months off work. One to his leg - off work for 6 months.

Social History: Habits. Moderately temperate man.

Tobacco 2 oz. per week. Used to be a heavy smoker.

Family History: Married.

Has 1 daughter - who is alive and well. Mother and Father both dead - quite healthy, while alive.
Physical Examination:  Temperature 97. Pulse rate 92.

Respirations 20.

The patient is fairly well nourished and does not look very ill. He thinks he is paler than he was, but there is no marked anaemia.

**Pupils:** Equal and react normally.

**Tongue:** Dry, thickly furred, Brownish white fur.

**Teeth:** Upper and lower dentures.

**Abdomen:** Moves quite freely with respirations, Looks well nourished. The skin is dry looking. As a whole the abdomen is rather protuberant and distended. There is a slight fullness in both flanks. No visible peristalsis.

On Palpation: the skin is quite elastic and there is no obvious loss of subcutaneous fat. The umbilicus is not fixed. There is no superficial or deep hyperaesthesia. No tenderness can be made out, and no lump felt.

On Percussion: there is a generalised tympanitic note with slight dullness in the flanks. No evidence of free fluid in the peritoneal cavity. The liver is not enlarged. The spleen is not palpable and there is no renal tenderness. There is succession heard over the Caecum and occasionally a gurgling noise can be heard on auscultation over the lower part of the abdomen in the mid-line.

**Per Rectum:** Rectum is empty - Prostate felt normal.

Respiratory System: No cough. No abnormality.

Nervous System: N.A.D.

Urine: Contains no abnormal constituents.

Faeces: Benzidine Negative.

Ordinary X-ray Examination: 26/2/29

Marked gaseous distension of the proximal colon ceasing at the upper end of the descending colon below which the calibre is normal stopping about the junction of the descending and pelvic colon.

Provisional Diagnosis:

Stricture in the Transverse colon.

Treatment:

The patient was given an olive oil enema and Pituitrin. This produced a small faecal and moderate flatus result. Next day the patient was easier. In the forenoon he vomited a little brownish, but not foul material. Another enema and more Pituitrin were given in the evening. There was very little flatus result. Vomiting occurred again on Saturday morning. Pain was still present occasionally. It was decided to give another enema and if no result followed - a caecostomy to be performed. However, the splashing in the lower end of the Ileum and over the caecum
became very marked and the abdomen became distended and the tongue very dry, so that a caecostomy operation was resorted to.


Anaesthetic: Local Anaesthesia with \( \frac{1}{3} \% \) Novocaine. Scopolamine and Morphine.

A small muscle splitting incision was made near the anterior superior spine on the right side. On opening the abdomen some colourless free fluid escaped. A loop of distended Ileum presented and was pushed away. The caecum was found and brought out into the wound. It was distended. A portion of the Caecum was emptied, clamp applied and a small rubber tube inserted after Semm's method with two fine purse-string sutures. The peritoneum was sutured to the caecum with a fine silk suture at the upper and lower ends. Iodoform gauze was wrapped round the tube in the wound and the skin approximated with 3 silk-worm gut sutures. The tube was washed through on the table and a large quantity of faecal material evacuated.

Summary: Tube caecostomy for a subacute intestinal obstruction which was becoming acute.

Progress Notes:

3:3:29 Caecostomy draining well.

4:3:29 Put on to Petrolagar.

5:3:29 Normal motion.
Complications

Occasional Notes and Prescriptions (To be copied into the General Report)

3.3.29. Carotid trauma improved very well.

4.3.29. Put on petrolatum.

5.3.29. Had a normal msoon.

7.3.29. 10 mil. Sheep 50 mil. B.C.D. 1st injection.

12.3.29. 2nd.

19.7.29. Feels very well after operation.

Slight rise in temperature.
Pulse - auricular fibrillation.

24.3.29. Guinea per carotomy Z.VIII Olmi Oil tube slipped.
Two very good facial motions.

27.3.29. Tube out.
7:3:29 Vaccine treatment begun - First injection of 50 mil. B. Coli. and 10 mil. Streptococci.

12:3:29 Second vaccine injection.

12:3:29 Barium Enema.

Barium enema outlined a very large loop of pelvic colon and was then held up in the descending colon at the level of the Iliac crest, the head of the meal tapering to a point above which, only a small amount of Barium had entered the proximal descending colon. Enormous gaseous distension of caecum, ascending and Transverse colon.

Conclusion: Examination is highly suspicious of neoplasm of the descending Colon.

14:3:29 White Blood Corpuscles - 5200

Given 5cc. 5% Nucleinac acid.

15:3:29 W.B.C's. 9400.

After the distension of the abdomen had cleared away to some extent, there was a suspicious that there was something palpable in the left lumbar region.

The bowels were cleared out thoroughly, before the operation of removal of the cause of the obstruction, by means of enemata. Castor oil was given 3 days before and an enema on the morning of the operation.

Operation: 15:3:29 Performed by Professor Wilkie.

Anaesthetic: Twilight Sleep:

Spinal Anaesthetic (0.7cc. of 10% Stovaine in glucose).
An oblique muscle splitting incision in the left Ilio-lumbar region was made. The peritoneum was opened and the hand pushed into the abdomen. A tumour of the Iliac colon involving the parietal peritoneum with some enlargement of the Paracolic glands and of one or two mesenteric glands was disclosed. The descending colon was mobilized and the parietal peritoneum ¼ inch round adherent to the tumour was separated. The Pelvic Colon and descending colon were then mobilised forwards until their vessels of supply could be clearly identified. About 10 inches of the Colon was resected after ligation of the vessels in the mesocolon. In making a 'cuff' at the upper end, the mucosa was inadvertently knicked and a small escape of faecal matter occurred. In all probability however, no soiling of any moment took place.

The cut ends of the colon were joined over two Shoemaker's clamps by one layer of Lembert sutures. Rent in the mesocolon was closed with Lembert sutures. The abdomen was then closed in layers and a small rubber dam drain inserted down to the bare area from which the tumour was removed.

The anaesthetic was satisfactory. Blood Pressure fell - Systolic 38 during the operation, but had commenced to rise before its end.

Summary: Resection of tumour of the Iliac Colon invading the abdominal wall.
End-to-end anastomosis by one layer of sutures over clamps. A small gland just at the level of Section of the mesocolon was removed for microscopical examination.

**Prognosis:** Both immediate and remote should be good as no evidence of distant metastasis was found. The free fluid present at the first operation had absorbed and was evidently the result of congestion from obstruction. No peritoneal nodules could be felt or seen.

**Post-Operative Treatment.**

The patient felt quite well after the operation. There was a slight rise in temperature. The pulse became irregular and the heart began to fibrillate.

On being taken back to bed carefully, his head was kept as low as possible for 24 hours by means of blocks under the foot of the bed. Then the bed is levelled for 6 hours and after that the patient raised by pillows under the head. 1/12 gr. Heroin given the night after the operation. Kept on fluid diet for 2 days without milk. 1 tablespoonful of Liq. Paraffin was given on the day after the operation. The first motion was passed on the 3rd day. An enema was given on the 5th day.

On 21:3:29 Olive Oil \( \frac{3}{4} \) were given per caecostomy tube and the tube clipped. Two very good faecal motions were made.
Commentary.

The history which is elicited from the patient is much more indefinite than in the previous cases. The reason for this is that the condition was suspected earlier, before the characteristic symptoms and signs had fully developed. The alteration in the bowel habits from regular to irregular is a symptom only in the background, while tiredness, loss of energy, colicky abdominal pains with borborygmi are more prominent symptoms. The symptoms and physical signs however are quite sufficient to show that they are due to a constricting process which is going on in the bowel. The marked anaemia, so characteristic of Caecum carcinomata is absent.

When the bowel becomes gradually constricted by an adenocarcinomatous process the activities of the colon are very liable to become deranged. This was evident when the patient became run down in health as a result of too hard work and damp surroundings. The bowel wall becomes oedematous and threatens obstruction at the site of the constriction.

There are many possible causes which lead to a final occlusion of the bowel, and in particular is a
dose of opening medicine liable to produce it. The gut becomes irritated and hyperaemic, Castor oil was taken in this case and resulted in a subsequent stoppage of the bowels. This frequently passes off when the hyperaemia subsides and this makes the line of treatment so varied.

In the physical examination of the patient, we note the good general condition of the patient, the absence of signs of toxaemia, the fullness which is present in both flanks with succession over the caecum. The condition of the caecum is the 'keynote' to the diagnosis and the guide to proper treatment. All evidence pointed to the site of the obstruction, being situated in the large bowel. Moreover X-ray examination without giving Barium which was carried out here is often of great help in coming to a diagnosis. For the bowel distended with gas above the obstruction, is recognisable by its characteristic sacculolation, whilst the contracted bowel below gives no obvious appearance on the plate. It was thought that the site of obstruction might be in the Transverse Colon but this is usually accompanied by symptoms referable to the stomach such as indigestion etc. which were not present in this patient.

We may compare the present case with Case I where the acute attack of obstruction had followed on top
of a long chronic condition. The difference being, that the acute obstruction in Case I had taken longer to become acute and in the meantime the bowel had tried to compensate by hypertrophy and dilatation of the portion above the constriction, whereas here the chronic obstruction did not give rise to symptoms for so long and the acute attack was not severe but rather subacute in character. The bowel above the constriction was not markedly hypertrophied and compensation was fairly good.

The picture of the two patients side by side would be striking - In Case I - acute obstruction of the colon with marked toxaemia, marked distension and faecal vomiting - a patient who looks ill. In Case III - acute obstruction of the colon, the patient looks moderately well, with some distension and slight vomiting.

Influence of condition on treatment:

The condition of the patient is of great importance in the treatment. And it is here, that we have the chance of applying palliative measures in the hope that with repeated enemata the obstruction might pass away and allow radical operation later on. The danger of thus temporizing is that of gangrene of the caecum which has to bear most of the back-pressure of the intestinal tension. A localized tenderness over the caecum would therefore be a
strong contra indication to temporize. As the caecum however was only moderately distended it was resolved to try to relieve the obstruction with enemata. The first olive oil enema and Pituitrin improved the condition to a slight extent and so a second enema and Pituitrin was given. The patient's condition in spite of this was becoming worse by showing signs of increased distension and splashing in the caecum with vomiting. Pain began to be felt over the lower abdomen, and so this method of treatment had to be abandoned in place of a safer and surer method of relief, namely 'blind' caecostomy, which in this case proved very successful - giving time for the bowel to subside and for a more definite diagnosis to be made. The method of Caecostomy performed was slightly different from Case I. Instead of the peritoneum being sewn to the caecal wall in the first place as in Stile's method - the caecal wall was drawn out of the wound, and clamped and a hole was made with a knife in it and a rubber drainage tube pushed into the caecum. The tube is put in such a way as to form a valve. This method is preferable to that in which the tube is just put into the caecum without making a valve. The danger however is that of rupture of the caecum when it is being brought out of the wound.
A wide collapsible rubber tube was tied on to the end of the rubber drainage tube projecting from the dressings and carried over into a pail under the bed. The tube remains usually quite water and gas tight for as much as a week and as the contents of the caecum are liquid they drain away quite readily through a tube of this size. No leakage takes place in the wound and the patient can be kept dry and comfortable. The tube in the caecum gets loose usually in about 8 or 9 days - here it was removed on the 10th day and there is seldom any leakage after it.

**After-treatment of Tube Caecostomy.**

With the tube in the caecum a mild aperient can be given at any time, as it will act through the caecal tube. The rectum and sigmoid can be irrigated with saline gently the day after the operation if necessary. The patient is fed on ordinary food from the first. The bowels are kept moving with liq. paraffin or petrolagar and salines.

The operation for resection took place 14 days after the caecostomy was done and the preparation of the patient was the same as in Case I. The value of the caecostomy operation was brought home all the more in this case as, when the abdomen had subsided, a definite lump could be felt in the left lumbar region.

Spinal anaesthesia and Twilight sleep were again used and proved very successful, giving complete and
LONGITUDINAL SECTION OF LARGE GUT

Case III
McCallum

ADENOCARCINOMA

Solitary Papilloma.

Folds of Gut

Papilloma begun to slough at its tip.
Papillomata

Tumour growth in section.

Thickened wall.

Tumour growth in section.

Mesenteric tissue.

Adipose tissue.

Site of obstruction

Lumen of gut
easy relaxation. The operation performed to remove the cause of the obstruction was similar to that in Case I. Before opening the abdomen however one has to keep in mind the possibilities of finding a growth which is irremovable. The line to adopt in this case would be to make the patient more comfortable and prolong his life. The operations that may be performed for this purpose are:

**Excision of as much of the growth as can be got away i.e. resection of the primary growth.**

Short circuiting the growth.

Making an artificial anus above the growth. Short-circuiting the growth is undoubtedly the best method when it is found that excision is impossible. It does away with the danger of obstruction and does not leave the patient with the discomforts of a colostomy.


*Specimen: in longitudinal Section:*

An adenocardinomatous growth projecting into the lumen of the bowel and almost completely filling it up. It extends longitudinally for 1\(\frac{1}{4}\)" and is rather cauliflower in character white and cheesy looking on section. One part of the tumour is definitely pedunculated and closely resembles a papilloma. Just proximal to the growth there are four small papillomata which are sessile and one which
has a long pedicle. The tip of this papilloma is ulcerated and necrosed. 1½ proximal to this another solitary pedunculated papilloma can be seen. The bowel wall distal to the growth is thickened and there are one or two small hard glands in the mesenteric tissue adjacent.

It seems probably that this tumour originated in one of these papillomata and became slowly malignant.

From this we see another type of tumour growth not the string stricture type but a growth which is invading the wall of the bowel all round and also projecting into the lumen in cauliflower fashion. Ulceration and necrosis frequently occurs in the later stages. The great danger of this type of growth is that once it has reached the peritoneal surface of the bowel metastases to the liver etc. are very rapid. Actually the tumour itself is quite slow growing.
CASE IV.

Name: Margaret Clunie.

Age: 71

Address 20 High Beveridge Well, Dunfermline.

Recommended by Dr. Cairneross - Dunfermline.


Diagnosis: Adeno-carcinoma of Ascending Colon involving the adjacent peritoneum.

Complaint: A lump associated with stinging pain on pressure in the right lumbar region - Duration 3 months. Loss of weight and weakness for 6 months. Loss of appetite. Anaemia for 1 month.

History.

Just before the New Year the patient noticed a pain in the right lumbar region. It was not severe though at times it would give a sting. Three weeks later she felt a lump in the place where the pain was first felt. This lump has got steadily larger and she can put her finger on the centre of the lump where she experiences a sharp stinging pain sufficient to make her squirm. The pain is often felt worse at night, and she has felt it more comfortable to lie on her back while in bed, because if she turned on to her side she would have the feeling as though something were dragging from right to left and if she
turned on to her right side the pain became very severe. The pain does not radiate to the back or down the leg. It has no relation to food and is not made worse by walking.

Off and on for about 6 months she has had rumb­lings passing up towards her stomach from the right side and then across the abdomen and down the left side. These rumblings have been most marked since she felt the lump in the right side. They are often worse just when going to bed, but she thinks she has paid more attention to these since being alarmed about the tumour. There is no history of peristaltic movements being felt in the right side.

The patient has always been constipated and frequently would go for 3 days without a motion and feel none the worse. She does not take opening medicine for this, and the condition has not been any worse since her present trouble began. Never any attacks of diarrhoea. No history of melena or haemorrhoids. No trouble with micturition. She has always been pale, but recently she has noticed that her colour has become yellowish and sometimes greyish. Since the New Year she has not been so strong and gets much more easily tired. She gets breathless easily and has a winter cough. Till the beginning of her trouble she always had a good appetite but now she says she has
been worrying a good deal and this has put her off her food. She feels hungry at lunch time and takes a good meal. There is no post-prandial discomfort. She is never troubled with indigestion. She began to lose weight 6 months ago, but lately she has lost a good deal. No nausea or vomiting, and has not been troubled with flatulence.

**Previous History:**

A healthy strong woman, but troubled off and on till the menopause with attacks of the bile'. During these attacks she would have frequent vomiting. No indigestion and no jaundice.

**Menstrual History:** Menopause at 43 years.

Has had 8 children. For the past year she has been troubled with uterine prolapse.

**Family History.**

Mother and Father were healthy while alive.

Has 5 boys and 3 girls - all healthy.

**Physical Examination:**

**State on Examination:** The skin of the face is dry and like parchment. There is very evident loss of flesh. She has a yellowish sallow complexion with a dark ringed appearance about the eyes. The eyes are sunken. On the whole the patient is remarkably active and alert for her age.

Mucous membranes show definite anaemia.

There is a tinge of yellow in the conjunctivae.
Pupils: Equal and react normally. Arcus Senilis is present.

Tongue: Furred at the back but clean and moist at the front.

Teeth: Upper and lower dentures.

Abdomen:

Thin lax abdomen. The skin is wrinkled and has lost its elasticity. Marked wasting of the tissues. There are several De Morgan's spots present.

On inspection: there is bulging in the right flank and hypogastrium but flattening or hollowing in the left flank. In the right lumbar region a definite lump about the size of a golf ball can be seen, which moves downwards on inspiration.

On palpation: Coils of intestine can be felt in the left iliac fossa and gurgling noises can be elicited with pressure. There is no rigidity or any tenderness in that area. On palpating across the abdomen to the right side, one is struck with the gurgling noises which are produced. These noises are also heard when the hand is taken off the abdomen. Peristaltic movements can be felt and seen especially when stimulated by hand. On coming to the right lumbar region, the hand encounters a large mass. This is about the size and shape of a Jaffa orange and is very hard. It has a peculiar ridge across its middle and the parts just above and below this are
extremely hard. The part above the ridge is very tender to the touch and causes a stinging pain. Distal to this mass the rest of the Caecum can be felt and in it gurgling noises can be heard and felt. The tumour mass is slightly fixed to the surrounding tissues on its right lateral side and there is tenderness on pressure between the Iliac crest and the right costal margin. The tumour moves on inspiration and can be moved to a slight extent within the abdomen.

On percussion: the intestines are hyperresonant but there is dullness over the tumour mass. There is no enlargement of the Liver or Spleen. No renal tenderness. No free fluid.

On auscultation - the gurgling noises are much augmented and the fluid can be heard, when distal pressure is made to pass through a constricted lumen. Splashing can be made out in the stomach and in the lower end of the Ileum.

Per Rectum: Nil abnormal felt.
Stools: Benzidine positive.
Urine: Contains no abnormal constituents.

Circulatory System: Vessel walls are palpable but not irregularly thickened. Heart is not enlarged. 1st Mitral sound is short. Nil else to note.

Respiratory System: Bronchitic cough present with rales. Thin emphysematous type of chest. Movements
THE ROYAL INFIRMARY OF EDINBURGH.

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Complications

Occasional Notes and Prescriptions (To be copied into the General Report)

Was profoundly under morphia after operation.

Pulse good - 7 - 8 pints fluids given per chonostomy.

13.3.29. Coughing a good deal with thick tenacious, yellowish red sputum.

Put on digitalis mg r. i. d.

Liq. Paraffin

14.3.29. Not quite so well - cough troublesome.

16.3.29. Fluid per g.b. stopped.

G.B. draining.

17.3.29. Petroleum given.

18.3.29. Bowels moved - normal motion.

19.3.29. Paraffin instead of Petroleum.

21.3.29. Chest troubling her. Sputum ++ - thin mucous

Boas filling up a little.

24.3.29. In evening patient became very bad

Died suddenly.

P.m. a little. Death seemed to be due to cardiac failure and hypostatic pneumonia.
are fair and the note is hyperresonant.

Breath sounds bronchial in character in the upper half of the chest anteriorly. Posteriorly they are broncho-vesicular with prolonged expiration. Few rhonchi at the right apex.

Nervous System: N.A.D.


The patient was apparently unable to retain the enema after it had reached the mid-transverse colon, after this the bulk of the Barium being returned but a little passed to the hepatic flexure.

Conclusion: The estimation and appearances on the film are more suggestive of inability to retain the enema than indicative of organic lesion.

Pre-operative treatment:

6:3:29 Castor oil: Barium Enema given.
7:3:29 Soap and water enema and Castor oil at night - 3 motions of bowel.
   Vaccine Injection - 10 mil. Streptococci} 50 mil. B. Coli. }
8:3:29 4 Bowel actions.
9:3:29 Cascara - No bowel action.
10:3:29 Castor oil - 4 bowel actions.
11:3:29 Soap and water enemata.
   W.B.C's. - 11,600.
   4cc. of Nucleinic Acid given.
12:3:29 3 bowel actions.

Hypodermic Injection of Scopolamine 1/100gr.
Morphine 4gr. at 9.45a.m.

Hypodermic Injection of Scopolamine 1/200gr.
Morphine 1/6gr. at 10.45a.m.

Operation: - Performed by Professor Wilkie.

Anaesthetic: Twilight Sleep -
Spinal Anaesthetic - (0.7cc. of 10% Stovaine in Glucose).

Incision: Oblique right ileo-lumbar incision cutting through muscles.
Peritoneum opened. A tumour of the ascending colon was found adherent at one point to the parietal peritoneum. It was ascertained that there were no secondary deposits either in the Liver or Peritoneum. The glands in the mesentery were not grossly enlarged. The tumour however had extended locally and had involved the peritoneal tissues and muscular planes. It was deemed removable.

The Peritoneum was mobilised to the outer side. The Caecum and ascending colon were stripped up together with the growth and tissues in the right iliac fossa. The vessels - right colic and ileo-colic were then defined and ligated, care being taken to avoid the duodenum ureter and ovarian vessels. The Transverse colon was treated by the 'cuff' method ligated...
and divided at its centre. The Ileum, over two feet above the ileo-caecal valve, was similarly dealt with. The ends were invaginated and lateral anastomosis performed with silk Lembert sutures after the rent in the mesentery had been closed. A very large raw area was left which could not be covered.

The Gall Bladder was found to be distended and contained numerous spiculated pigmented gall stones. It was opened and these were removed. A rubber tube was stitched in for purposes of giving fluid. The patient's blood pressure fell to below 40 during the operation. The pulse was not palpable at the wrist but the Aortic pulse was regular between 80 and 90 and of moderate force.

Summary.

Carcinoma of the ascending colon, adherent to the parietal peritoneum. Extensive resection of proximal colon. Ends closed.

Lateral anastomosis.

Cholecystostomy for purposes of instilling fluids.

Immediate prognosis guarded, ultimate fairly good.

Post-Operative Treatment; Progress Notes:

The patient was taken back to bed carefully keeping the head low. The foot of the bed was raised on blocks for 24 hours. Then levelled for 6 hours. After that the patient was raised by pillows to promote
drainage and prevent lung congestion.

A hypodermic injection of Pituitrin ½cc. was given at 12.45 p.m.

Hypodermic injection of Heroin 1/12gr. at 9.45 p.m.

"  "  "  1/12gr. "  3.10 a.m.
"  "  "  1/12gr. "  8.20 a.m.
"  "  "  1/12gr. "  2.45 p.m.
"  "  "  1/12gr. "  9.45 p.m.

The pulse was good after coming out of the anaesthetic tube.

7-8 pints of fluid were given per cholecystostomy tube.

13:3:29 The patient had a lot of coughing - bringing up thick tenacious yellowish red sputum. Steam kettle and tent used. Put on to Digitalis T.i.d. and Liquid Paraffin.

14:3:29 Not quite so well - cough troublesome.

15:3:29 H.I. of Heroin 1/12gr. given at 9.15 p.m.

Bile began to flow from the tube.

16:3:29 Fluid per Gall bladder was stopped.

17:3:29 Petrolagar given. Bile passed - 3x

18:3:29 Bowels moved - normal motion - Bile 3v

19:3:29 Paraffin given instead of Petrolagar Bile 3v

20:3:29 1 Bowel action . Bile 3v

21:3:29 Chest troubling her: Sputum ++ Thin mucopurulent. Bases of the lungs filling up Bile 3v
Temperature up to 99.5°.

29:3:29 In the evening the pulse became very bad and the patient died suddenly.

Post-mortem on abdomen etc.

Death appeared to be due to cardiac failure and hypostatic pneumonia.
The history which we are given here is important in this respect - that it shows how the symptomatology of Caecal carcinomata differs with the individual. Yet the main symptoms always point to a tumour in this situation - namely the anaemia, rumbling noises and a palpable mass. The evidence we get here shows how very latent cancer in this region can be.

Pain was the first thing which this patient noticed, and this drew her attention to the lump in the right side. The rumbling noises were present for longer than the pain but at first the patient did not associate them with her present condition. The habitual constipation is not of much importance in the history since it was not any worse when the present condition came on. Anaemia was present but the patient did not appear so pale and yellow as is usually the case. The results of anaemia did however show themselves in her tiredness and loss of strength. In contrast to Case II we find no gastric symptoms present such as indigestion or dyspepsia. The patient's previous history of attacks of the 'bile' is significant in that it bears out the finding of spiculated pigment gall stones during the operation. Briefly, gall stones may be classed as firstly the Aseptic Stone which is found usually in fat, multiparous women with a high chole-
sterin content in the blood. The cholesterin stone forms in the fundus of the gall bladder and becomes loose. When the patient goes to bed the stone is dislodged to the neck of the gall bladder and there is severe biliary colic pain caused. There is no indigestion. Symptoms reach a climax and then pass off. Pain is followed by vomiting. Secondly we find the secondary Septic stone - Infection of the gall bladder takes place with inflammation and pus formation perhaps. The results are

(a) Flatulence - she feels she has to undo her corsets - she is blown up with wind.
(b) Indigestion - certain foods make the condition worse and fats are especially bad. The indigestion is constant but never very severe.
(c) Attacks of vomiting - once or twice a week - attacks of the 'bile' so called - which this patient suffered from.
(d) Complains of shoulder pains. There is also a feeling of constriction across the epigastrium due to sympathetic nerve irritation.

The condition may arise from a bad pyelitis just after labour - associated with constipation at the same time. There may be a stabbing pain in the appendix
associated with bad teeth. B. Coli and Streptococci get into the Biliary apparatus and result in multiple stones. This patient had 8 pregnancies and it is quite conceivable that the gall stones formed as a result of some infection getting into the gall bladder e.g. from the bowel, as she has been constipated all her life or from some pyelitis before or after labour. There is a high cholesterin content in the blood during pregnancy. Since the menopause, however the patient has not been troubled with gall bladder symptoms. In the physical examination we note the ease with which a peristaltic valve is excited. The whole wave can be traced as it passes along and when it reaches the block at the caecum the bowel can be seen to bulge out. De Morgan's spots were again present and were numerous. In association with the marked involvement of the adjacent peritoneum the pain is severe in a certain place. The condition of the chest was not considered bad enough to contra-indicate operation. A vaccine injection was given as before, to raise the patient's resistance and there was a good response made the W.B.C's. being 11,600 per c. um.

Spinal anaesthesia was very successful and produced an excellent state of laxity. Though the growth had spread locally it was deemed removable resection being carried out with a subsequent lateral
CASE IV.

Carcinoma of the CAECUM.

A = Adenocarcinomatous thickening of the Caecal wall.
B = Ileo-caecal valve.
C = Appendix.
D = Fat in the mesentery.
E = Flame.
F = Faecal matter inside the Caecum.
anastomosis.

Stones were removed from the gall bladder and advantage was taken of the opening by inserting a tube so as to supply fluids. Since such a large portion of the absorptive area of the gut was removed it was anticipated that the patient might suffer from lack of fluid and nourishment. Several pints of glucose saline were able to be administered daily until bile began to drain away automatically. After the operation the patient was profoundly under the influence of Morphia but quickly recovered and the pulse became good. Unfortunately the chest condition became worse, with coughing and thick tenacious expectoration. The steam kettle and tent were employed and this eased the condition for a time, until the patient's strength began to fail - and death resulted.

Path. Report: Clunie:

Specimen of Caecum in Longitudinal Section:

Large fungating adenocarcinomatous mass which has invaded the wall of the caecum, extending from the level of the Ileocaecal valve to the other end of the Caecum. The wall of the caecum looks like a cheesy mass. The interior of the Caecum is darkly coloured and the surface has necrosed in places. The growth also extends up into the lower end of the Ascending Colon. There is adipose tissue on the exterior of the Caecum and in the mesentery.
CASE V.

Name: Christina Dearness.

Age: 54 years.

Occupation: At home.

Address: 304 Easter Street, Edinburgh.

Recommended by: Dr. Kerr, Newhaven Road, Edinburgh.

Admitted: 3:4:29

Diagnosis: Inoperable Adenocarcinoma of the Caecum.

Complaint: Pain low down in the right side Duration 2 years.

Anaemia.

Loss of energy: Weakness.

History:

About three years ago the patient began to get very anaemic. When walking about she would feel as though the ground were coming up to meet her and that she would drop if anyone gave her a push. She had to go to bed for about 5 or 6 weeks. Breathlessness troubled her a good deal. She got up out of bed against orders. Then she experienced a pain in the right side just over the Liver and passing towards the mid-line. It was sore when she pressed it. This pain has been present ever since, but is more a feeling of fullness than a pain. It is worse at bed time but more comfortable when standing up. After this, that is about 2 years ago, she was seized with a
severe pain in the right side in the right Iliac fossa, which radiated round the front to just below the Umbilicus. This pain was stabbing in character and relieved by castor oil and an enema.

During last summer she was very free from attacks. From then till four weeks ago she had four attacks. These attacks have been more severe and have lasted longer. She usually had to go to bed for a day or two when the attacks of pain were on. The pain then got gradually less and the average duration of an attack was 2 weeks. Four weeks ago the pain became worse and more frequent until now she is practically never free from it and has had several acute exacerbations, usually about \( \frac{1}{2} \) hour after food. It is very sore when lying on her right side, but when on her left side it is not actually a pain but a dragging sensation. The acute pain has now a wider radiation, sharp and shooting in character down the inside of the thigh and up to the chest.

For many years the patient has been troubled with constipation, and when she has been taking Iron pills for her anaemia, the constipation has been worse. Lately she has been taking purgatives regularly to keep up her daily motion. There has never been any diarrhoea or mucus passed. The patient does not think the stools were ever darkly coloured when she
was not taking Iron. For the last few days the bowels have been easier, the motions softer, and that has relieved the pain.

Borborygmi are always associated with the pain, and their occurrence seems to ease it. During the last four weeks the rumblings have been very frequent, and peristaltic movements have been felt by the patient over the caecum. They begin well round in the right flank, run round the back and are felt again round on the left side. She can trace the course each time. They come frequently, and she would be frightened to eat food lest the pain and noises should begin and get worse. She found that liquid food agreed best with her.

There has never been any sickness and her appetite has been fairly good, though she was always a small eater. Within a year, her weight has dropped from 13 st. to 12 st. During the last 4 weeks there has been frequency of micturition, having to rise often during the night. She has lost a lot of strength during the last year and is barely fit for her light work.

Previous History:

Measles at 27 years. Had growths removed from the left breast in 1912 by Mr. Wade and in 1919 by Professor Wilkie. Soon after the commencement of menstruation she had serious menorrhagia. The last
attack being 5 years ago and lasting for 10 weeks. Dr. Haultain curetted her, but this did not improve the condition. Menopause at 51 years. There has been no bleeding or discharge since. Off and on for about 20 years she has had varicose veins in her legs - being worse on the left leg, where there is an ulcer.

**Family History.**

Father died of cancer in the Rectum.

3 brothers and 2 sisters all alive and well.

**State on Examination:**

A well built fairly well nourished woman. Has a clear complexion and is markedly anaemic looking. Her skin has a pale yellow appearance. There is no definite icterus in the conjunctivae.

Pupils - Equal and react normally.

Tongue - Clean and moist.

Teeth - Complete dentures.

Abdomen: There are several De Morgan's spots on the abdomen. Abdomen moves freely with respiration. Looks well nourished but is rather flabby. There is some bulging in the flanks which is symmetrical. No superficial or deep hyperaesthesia. On palpation a very indefinite hard mass is palpable in the right flank in the line of the ascending colon. It is difficult to make out the limits of the mass but it
is moderately fixed and does not move with respiration. There is considerable tenderness on handling the mass. The Liver and Spleen are not enlarged. A little tenderness is felt over the gall bladder on pressure. The Stomach is not dilated but succussion can be made out at the lower end of the Ileum. The umbilicus is not fixed.

Per Rectum: Nil abnormal felt.

Faeces: Benzidine faintly positive.

Urine: Contains no abnormal constituents.

Circulatory System:- Arteries are soft. Walls not thickened. Pulse is regular in time and force.

Blood pressure 120/80.

Heart: Apex beat 4" from mid-line in the 5th space. Systolic murmur is audible over the mitral and Aortic areas, but louder at the former.

Respiratory System: No cough: No abnormalities.

Blood. 6:4:29.

R.B.C's. - 3,970,000

W.B.C's. - 8,800 H6 = 40%

C.I. = 0.51

Neutrophil Polymorphs - 54%

Eosinophil polymorphs - 1%

Large Lymphocytes - 17%

Small Lymphocytes - 28%


The enema flowed freely through the Colon to the
mid-portion of the ascending colon. Large splenic
flexure was outlined. It is difficult to say
whether the proximal portion of the Colon is a dis­
placed high Caecum or whether the Caecum is not
filled by the enema. No barium could be got to
flow past this point.

Pre-Operative Treatment.

On admission:— Dose of cascara.

5:4:29 - Soap and water Enema in the morning: Barium
Enema given: Castor Oil at night.

and 10 mil. Streptococci.

7:4:29 - Dose of Cascara.

8:4:29 - Dose of Cascara. Stout Given B.i.d.

13:4:29 - Second Vaccine Injection:— 50 mil. B. Coli.
and 10 mil. Streptococci.

14:4:29 - Castor Oil.

15:4:29 - Soap and water enema in the morning - 5cc.
of 5% Nuclein given at night - subcutaneously.

16:4:29 - Soap and Water Enema in morning: W.B.C's.
12,400.

H.I. Morphine 1/4gr. and Scopolamine 1/100gr.
at 11.30 a.m.

H.I. Morphine 1/6gr. and Scopolamine 1/200gr.
at 12.30 p.m.

Operation at 1 p.m.
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- Urine, ozs.
- Sp. Gr.
- Reaction
- Chlorides
- Albumen

Day of Dis. 328
Note: Before the operation the patient was feeling well and had gained strength.


Spinal Anaesthetic: (0.7cc. of 10% Stovain in Glucose).

An oblique incision about 6" long in the Right Iliac fossa was made. The External Oblique muscle was cut in the line of its fibres and the incision was deepened down to the peritoneum in the same line. The peritoneum was opened and a large carcinoma was felt just above the ileo-caecal junction. This was found to be bound down to the posterior abdominal wall. Glandswere then felt along the right colic vessels with surrounding scar contraction. Some of the glands were adherent to the inferior vena cava and Aorta. Owing to this, and the fact that the tumour was adherent to the posterior abdominal wall it was decided against removal. The Transverse Colon was then found and a loop brought down. A loop of Ileum was also brought out and approximated side by side with the Transverse colon. After the first row of sutures had been put in the coats of the bowel were divided with the cautery down to the mucosa. The anastomosis was then completed without breaking down the mucosa of either loop of gut, but these were so devitalized by
cauterisation, that they will slough later and complete the anastomosis. A piece of omental tissue was stitched over the raw area and the peritoneum then closed. The wound was closed in layers, and a small rubber drain put into the subcutaneous tissues.

Summary: Inoperable carcinoma of the caecum and ascending Colon.

Ileo-colostomy performed.

Operation Note:

The patient withstood the operation well and the spinal anaesthetic produced complete relaxation of the abdominal muscles. The blood pressure fell to 50 during the operation but rose gradually towards the end.

Post-Operative Treatment and Progress:

H.I. Morphia 1/6gr. given at 11p.m. as the patient became restless.

17:4:29 Liquid Paraffin given morning and evening.

18:4:29 H.I. Morphia 1/6gr. given at 11.30p.m.


Chicken tea: Stout: a little tea but no milk.

20:4:29 Bowels moved for the first time since the operation. The patient feels quite well except for some pain in the Right Calf. There is a tender thrombosed varix here. Rest given to leg on a pillow.

23:4:29 Petrologar begun instead of Liq. Paraffin -
given B.i.d. Wound dressed. Quite healthy. Temperature went up slightly.

24:4:29 Soft foods begun - Fish - Chicken - A small piece of toast - Strained porridge with a little milk. The milk gave her a pain in the right side again and some wind.

26:4:29 Patient feels well and stronger.

28:4:29 The patient is not so yellow as she was before the operation. She has begun to have an appetite for small amounts of food. She sleeps well at night and feels much better.

30:4:29 Sent home.
Discussion.

On approaching the bedside the colour of the patient's face is at once striking. It is pale yellow but the eyes are clear. The next most striking feature is the marked degree of weakness. On trying to say a few sentences, exhaustion overtakes her and she is forced to close her eyes for a time. This weakness and degree of anaemia can well be explained by the history which the patient gives - a progressive anaemia for two years. The further points in the history, severe pain in the right Iliac fossa with borborygmi and palpable peristalsis associated with the anaemia and weakness, at once centre our attentions on the caecum. It must not be forgotten however that the various symptoms may be altered in degree by the presence of other conditions. This patient had some considerable trouble during her menstrual life and had severe attacks of menorrhagia. Again, the first pain which she felt over her liver may have been due to an attack of gall stones. She says that this pain was relieved when she stood up and became painful when lying down. A stone may have formed and got impacted in the neck of the gall bladder when she lay down. The study of this case brings out more and more the importance of an early diagnosis in caecal carcinomata. When pain in the caecal re-
gion associated with anaemia is discovered it is time to explore or ascertain whether there is a malignant growth there or not. The dragging sensation which the patient had when lying on her left side was very suggestive of an involvement of the structures adjacent to the caecum. Once the tumour begins to invade the adjacent peritoneum the symptoms are aggravated and the course seems more rapid, as evidenced here by the severe pain and also the increased frequency of micturition during the last four weeks, from irritation of the ureter lying behind the growth. The preoperative treatment consisted in resting the patient completely for nearly a fortnight and preparing the bowel by clearing it out with purgatives and enemata. At the same time endeavouring to raise the patient's resistance to infection by injecting vaccines and stimulating the formation of leucocytes by nuclein. The patient responded well to this treatment - the leucocytes reaching 12,400. The oblique incision was chosen at the operation as it gives an easy access to the Caecal angle should a resection be necessary. The growth however was firmly fixed to the posterior abdominal wall but this alone did not contra-indicate removal. It was owing to the fact that the Aortic glands and those round the Inferior Vena Cava were involved. As a palliative measure an
Ileo-Colostomy was performed. This relieved the symptoms of pain of which the patient complained, and about a week later, the yellow anaemic appearance had improved. The diet and attention to the bowels are important features of the post operative treatment. The diet should be fluid for as long as possible, and milk must be avoided owing to the wind which results. Stout given twice a day was well tolerated by the patient before the operation, and so it was given again after the operation.

Prognosis: The prognosis in this case is not good - and when the tumour has reached the stage which it is at now there is little possibility of the patient surviving more than 3 months. They are very prone to intercurrent infections.
CASE VI.

Name: Mrs. Margaret Fraser.
Age: 63 years.
Occupation: Housewife.
Address: 159 Link Street, Kirkcaldy.
Recommended by Dr. Brown, Kirkcaldy.
Diagnosis: Adenocarcinoma of the Pelvic Colon.
Complaint: Stoppage of the bowels for 6 days.
Increasing constipation for 6 weeks.
Sickness for 6 days.

History:

About 6 weeks ago, the patient had a fall on her back and suffered pain for several days. After this she noticed that her bowels became more irregular. They had always been constipated, but now she would go two or three days without the passage of flatus or faeces. Four weeks ago she was troubled with diarrhoea for two days; after that constipation became more marked. The patient had to strain, and felt the bowels were never completely empty. She never passed slime or blood by the bowel. In the mornings especially, the patient found that the feeling of never being able to empty the bowels was worse. She never had any pain, either on emptying the bowel, or in the back, or abdomen. On Saturday,
March 23rd, the patient took a turn of sickness, just before sitting down to a meal, and though she would be all right if she could vomit. Her abdomen swelled up and she had to loosen her corsets. She went to bed and on lying down, vomited a huge amount of green bitter material. This vomiting continued off and on till Sunday, when it became dark coloured and had a foul taste. Rumbling were felt in the abdomen, which went across the stomach, and down the right side. The doctor was sent for.

The patient felt the swelling more in the midline above the umbilicus at first, then down the right side. She was given a 'bottle' for her sickness, which relieved it. Milk and Potass was given and this stayed down, but a heavy feeling in the stomach remained. She took a dose of salts, but they did not act.

Oil was taken next morning, but this was no good. Then the nurse gave her enemata for two mornings with only a very slight action. Patient got blown up more and more with wind, until she could hardly get breath. It became very painful down the right side. After five days, the vomiting stopped, and she got thirsty and weak, and the doctor then sent her into the Infirmary, having not had a proper bowel motion for six days.
The patient has not noticed any loss of weight lately, but she has not been able to do so much work the last month or so. Her appetite has always been small. She has no trouble with micturition, and there is no appearance of anaemia. She has been troubled with a cough during the past fortnight.

**Previous History.**

Married.

Seven pregnancies - all normal - youngest daughter 21 years. Always been healthy except for rheumatism of late years. Before Xmas 1928, she had 'Flu, and for some days could not pass water. She was in bed for a week - had no trouble with her bowels then, and made a good recovery.

- Scarlet Fever
- Measles
- Whooping cough

Menopause at 50 - no bleeding or discharge since.

**Physical Examination.**

Pulse Rate 110. Temp. 98. Respiration 22.

Patient looks as though she had had a fairly hard life, and is thin and wasted. She shows some signs of dyspnoea - and there is present a bronchitic rattle - she looks ill - her face has a yellow tinge, but the cheeks have a reddish colour. No icterus in the conjunctivae, but some sign of anaemia.

Pupils - equal and react normally.
Tongue - rather dry and has a yellow fur towards the back. Breath is foul.

Teeth - false.

Abdomen: moves with respiration - the skin is faintly yellow, wrinkled, and has lost some of its elasticity.

There are no obvious signs of wasting.

The abdomen is enormously distended, especially in both flanks and across the abdomen - the note is tympanitic all over, except for a small area in the flanks - nothing is palpable owing to the distension.

No signs of peristalsis or ladder pattern.

There is tenderness in the right iliac fossa on deep palpation, but no superficial hyperaesthesia.

Nothing else to be made out on examination.

Per Rectum - Rectum empty and slightly balloononed - nil normal felt.

Urine - contains no abnormal constituents.

Circulatory System -

Pulse - rate 110. Regular in time and force.

Volume moderately good.

Arterial wall palpable but not thickened.

Blood Pressure - about 120.

Heart - Normal - all sounds pure.

Respiratory System -

Chest - Dullness towards the bases of both
lungs.
Crepitations at the bases.
Some general rhonchi.

Operation for relief of Symptoms:

Operation - Mr. Cochrane.

Anaesthesia - Scopolamine and Morphine
focal - 8.30p.m.

H.I. Morphine $\frac{1}{100}$ gr. Scop. 1/200gr. at 6.30p.m.

" $\frac{1}{6}$ gr. " $\frac{1}{200}$ gr. " 8 p.m.

A. McBurney's incision was made in the right iliac fossa. The muscles were cut in the direction of the wound, and pulled apart. The peritoneum was then exposed and gripped with peritoneal forceps. An opening was made, and at once there was a large escape of gas, and the abdomen became considerably smaller. The distended caecum was exposed, and a single linen purse string suture put in, fixing the caecal wall to the peritoneum. This shut off the peritoneal cavity from the outside. Taking a thin bladed knife, it was pushed through the caecal wall, which was projecting from the wound, and a large quantity of gas and semi-faecal matter exuded. A rubber tube was placed into the caecum, and the wound packed with Iodoform gauze. A silk-worm gut suture was put into the tube, fixing it to the skin.

Diagnosis. Acute Intestinal Obstruction of the large
bowl.

Operation. Blind Caecostomy -

The patient made a good recovery. lcc. haemostatic serum was given hypodermically the following day at 7.45 p.m. - and Heroin 1/12 gr. at 11p.m.

For the next three weeks, the patient was kept in bed, in the semi-erect posture, to aid drainage and prevent congestion of the lungs. Her cough disappeared, and her toxic appearance gradually vanished.

The caecostomy drainage was kept up, and the bowel washed out several times with soap and water enemata, and olive oil enemata. (Only motions per rectum after enemata - nil abnormal).

Three attempts were made on the 13th, 17th, and 21st respectively, to get barium enema into the colon, but these failed to get beyond the Pelvic Colon. This probably being an indication that the obstruction is in the distal part of the bowel.

Examination of Abdomen - 10 days later -

Abdomen softer, and skin more wrinkled. Still distended in the flanks, but fairly flat in the centre. The umbilicus is not fixed. An indefinite mass can be felt in the left iliac fossa.

Pre-operative.

Vaccine Treatment - 10 mil. Streptococci) given 2 & 50 mil. B. Coli. (10 days before.
5c.c. 5% Sod. Nucleinate the night before.

**Blood Picture 7:4:29.**

R.B.C's. - 3,780,000  
W.B.C's. -  4,800  
Polymorphs 71%  
Large Lymphocytes 15%  
Small Lymphocytes 13%  
Eosinophyees 1%

**18:4:29 After vaccine W.B.C. - 8,400 - another 5c.c. 5% nuclei.**

**19:4:29 10a.m. W.B.C. 12,500.**

On morning of operation - soap and water enema, and caecostomy wash out.

H.I. Morph. ½gr. - Scop. 1/100 gr. - 10a.m.  
  " 1/6gr. "  1/200 gr. - 10.40a.m.

**Operation - Professor Wilkie - 11.15 a.m.**

**Anaesthesia - Spinal. (.7cc. 10% Stovaine in Glucose).**

Table was slightly raised at the foot.

**Incision - a left hypogastric incision about 6inches long, and the left rectus muscle was dissected out. Pyramidalis muscle seen.** The skin vessels were then ligated. Clean towels soaked in hot saline were put on, and the rectus pulled to the side. The peritoneum was raised with forceps and opened. The hand was inserted into the abdomen, and a tumour felt
low down in the pelvic colon, which had perforated, also a small inspissated abscess, shut off by two coils of small gut. These were freed. The pelvic colon proximal to the tumour was inflamed, thickened and oedematous. The tumour was deemed removable.

Hot pack was put into to shut off the rest of the bowel from the field of operation. The iliac colon was next mobilized, and a retractor was used to get better access. The peritoneum was divided along the outer side, and scissors were used to cut and separate the fibrous extraperitoneal tissue, and the extraperitoneal space was opened out. The small abscess was seen on the inner side of the growth. The vessels were ligated in the mesentery of the pelvic colon, in relation to six inches of bowel, and it was noted that the lower end was indifferently supplied with blood. Two methods of procedure were then open to choice:

(1) End to end anastomoses after resection of growth. This was not considered here owing to the presence of oedema and inflammation, and the danger of suturing impaired bowel wall.

(2) Use of Clamp - removing the growth, and producing an artificial anus.
Diagram to make drawings.
The latter method was decided upon, and crushing clamps were put on above and below the tumour. After suturing the lateral margins below the clamps with silk thread; the tumour and 6" of pelvic colon were cut away, with a knife dipped in pure carbolic. Packs were removed, and the mesentery stitched up.

The stumps were brought out through the abdominal wound, there being considerable tension on the lower one. No catgut was used, owing to the danger of sepsis. Iodoform gauze was wound round the clamps next the wound. The skin was then closed round the clamps.

Summary: Carcinoma of Pelvic Colon.

Modified Mikulicz operation.

Post-Operative.

The patient sustained the operation well and the spinal anaesthesia was most successful. The patient's head was kept low, and the foot of the bed raised. H.

1. Morphia 1/6gr. - given at 12 noon. On the next day Liq. Paraffin 3 1/2 B.I.D. was begun, and Mist. Amm. Carb. 3ss - as a stimulating expectorant for the chest.


22:4:29 Caecostomy was washed out. Up till now - milk and fluid diet - chicken broth - now getting - cup of tea and toast at 5 a.m.
cup of tea and bread for breakfast.
Milk, bread and butter at night.
25:4:29 Upper intestinal clamp removed.

For the next 10 days the patient made very satisfactory progress and appeared bright with some colour in her cheeks.

After 5 days the spur was broken down by the use of the Enterotome. When the enterotome became loose there was swelling of the edges of the opening but this disappeared in a few days. The faeces began to pass in part by the normal channel.

With this artificial anus still present the patient was sent home and given instructions as to the care and cleanliness of the opening and told to return in 6 weeks to have it permanently closed. The opening may close of its own accord but this usually takes months and is therefore very tedious. The best method of closure is the intra-peritoneal one - where the involved loop is drawn out and then after cutting away the edges of the opening or if necessary resecting the involved portion of colon, to restore the lumen by direct suture. It is important to open
the abdominal cavity to one side of and well away from the fistulous opening. The tissues must be quite healthy at the line of closure. The blood supply to the part must also be carefully preserved. A rubber drain is put in down to the point of closure and the wound closed. The Caecostomy opening closes quite quickly of its own accord.

Prognosis: The prognosis is good and the patient will improve in health very quickly. The danger of recurrence is slight.

Discussion: The history which this patient gave prior to her acute attack of Intestinal obstruction was indefinite and any symptoms which were present were so mild and insignificant as far as she was concerned that they did not impress on her that there was anything wrong. She had a history of always having been constipated but only admitted that this had been becoming worse when it was suggested to her. She had an attack of diarrhoea about 4 weeks ago and this was significance though the typical frequent spurious morning diarrhoea was not present. It is remarkable that such a sudden acute attack of obstruction should occur with so few promonitory symptoms. Here it occurred like a bolt from the blue! It did not suggest a progressive slow narrowing of the bowel leading up to an acute occlusion but rather a sudden obstruction in a more or less healthy piece of bowel - in fact it was very suggestive of an acute Volvulus of the Sigmoid colon. The
first thing which the patient noticed was that she had a heavy feeling about the stomach and then she thought she would be greatly relieved by vomiting. Vomiting began reflexly at first and became mechanical, first emptying the contents of the stomach, then of the duodenum. She felt rumblings which followed a definite path, and her abdomen swelled up so markedly that she had to undo her clothes — no better indications of the condition from which she suffered. To palliate in a case of this severity is to decrease the chances of this patient's recovery. Her vomiting was treated — salts and castor oil were given without any effect (An enema may easily produce a slight motion as in this case merely from emptying of the bowel below the obstruction, and one might be misled in diagnosis when a patient passes a motion just after an attack of acute obstruction.) The patient's condition became worse and the increase in bowel tension began to tell on the caecum which got painful. Then the condition improved or appeared to improve — really a most dangerous period, because perforation had probably taken place and this was born out by the fact that a lot of gas and some fluid came out of the peritoneal cavity when the caecostomy was performed.

On examination of the abdomen one noted the marked degree of distension nothing being palpable
and no peristalsis being seen on this account. The note tympanitic all over a tenderness in the right side. On auscultation there were no gurgling noises to be heard but rather like the deadly silence of an Ileus. This again might have suggested an acute volvulus.

Balooning of the Rectum was found on rectal Examination and suggested a growth low down in the pelvic colon. Taking the risk of the condition not being due to an internal strangulation or volvulus of the pelvic colon - Blind caecostomy was performed. It was followed by immediate relief and is always the operation of choice in such a case. The method used was not that of volvular tube caecostomy as this always means additional exposure and handling of the caecum, but the method advocated by Stiles. It is a safe method especially when pain has been felt previously over the caecum from distensions.

Having relieved the emergency condition the next step was to ascertain the cause of the obstruction. This was attempted on 3 occasions by means of a barium enema but each time the enema was not retained. This indicated that the obstruction was probably in the distal part of the colon: when the abdominal distension had gone down an indefinite mass was felt in the left Iliac fossa and was taken to be a pelvic
colon tumour: since there was no evidence now of free fluid in the abdomen, the umbilicus free, the liver not enlarged or nodular, and no glands in the mesentery felt - removal of the tumour was decided upon and the patient prepared adequately for such, by cleaning the bowels out and giving vaccine injections.

At the operation the perforation, a small abscess round about was discovered and two coils of small intestine had shut it off. Resection of the tumour was carried out but the bowel wall was not healthy enough to risk an end-to-end anastomosis and consequently the modified Mikulicz operation performed.

Commentary.

Dealing with Distal Colon Tumours.

Cancer occurs more commonly in the colon than in any other part of the alimentary tract with the exception of the stomach. Colonic cancer however is of the less virulent type, that is to say, its rate of growth is comparatively slow, invasion of the lymphatic vessels and glands is relatively late, while remote secondary deposits such as liver metastasis are, save in advanced cases rare. It is on this account that there is such a favourable field for surgical intervention.
<table>
<thead>
<tr>
<th>Segment of Colon</th>
<th>Total no. of Malignant Growths</th>
<th>Percentage of Frequency of Cases</th>
<th>Relative % in Producing Cases of Acute Obst.</th>
<th>Order of Relative Importance</th>
<th>Recoveries</th>
<th>Deaths</th>
<th>Mortality</th>
<th>No. of cases not associated with acute obst.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caecum</td>
<td>25</td>
<td>5.15</td>
<td>6.35</td>
<td>4</td>
<td>8</td>
<td>3</td>
<td>27.27</td>
<td>14</td>
</tr>
<tr>
<td>Ascending Colon</td>
<td>11</td>
<td>2.25</td>
<td>1.73</td>
<td>8</td>
<td>3</td>
<td>0</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Hepatic Flexure</td>
<td>7</td>
<td>1.44</td>
<td>2.89</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>60.0</td>
<td>2</td>
</tr>
<tr>
<td>Transverse Colon</td>
<td>22</td>
<td>4.52</td>
<td>6.35</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>54.54</td>
<td>11</td>
</tr>
<tr>
<td>Splenic Flexure</td>
<td>39</td>
<td>8.04</td>
<td>16.18</td>
<td>2</td>
<td>19</td>
<td>9</td>
<td>32.14</td>
<td>11</td>
</tr>
<tr>
<td>Descending Colon</td>
<td>12</td>
<td>2.47</td>
<td>4.04</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>14.28</td>
<td>5</td>
</tr>
<tr>
<td>Sigmoid Colon</td>
<td>143</td>
<td>29.48</td>
<td>51.44</td>
<td>1</td>
<td>58</td>
<td>31</td>
<td>34.83</td>
<td>54</td>
</tr>
<tr>
<td>Rectum</td>
<td>226</td>
<td>46.57</td>
<td>10.98</td>
<td>3</td>
<td>13</td>
<td>6</td>
<td>31.57</td>
<td>27</td>
</tr>
<tr>
<td>TOTAL</td>
<td>485</td>
<td>173</td>
<td>114</td>
<td>59</td>
<td>34.10</td>
<td>312</td>
<td></td>
<td>1590</td>
</tr>
</tbody>
</table>
A comparison of the figures in columns 3 and 5 is of special interest. Although the sigmoid colon is the site of only 29.48% of all malignant growths of the colon, yet in it occurred 51.44% of all cases of acute colonic obstruction from malignant growth. Analysis according to the situation in the right or left half of the colon shows that only 13.29% of the growths causing obstruction were on the right side, as against 86.7% on the left. That is there is a 6.5 to 1 chance of a malignant growth that has caused acute colonic obstruction being found on the left side; a fact not without its importance in relation to operative treatment. It has been well shown from the Clinico-pathological aspect that cancer of the Colon exhibits 3 distinct stages:— The pre-cancerous, the Latent, and the stage of observable clinical manifestations. In the Pre-cancerous stage a lesion is present which is capable of developing into a cancer. Recent work has shown that a very strong tendency to malignant change is inherent in the simple intestinal adenoma. Cancer of the colon is invariably an adenocarcinoma. Duke describes its mode of origin as first the occurrence of small localized areas of epithelial hyperplasia from which arises a crop of adenomata; next, the formation of an adeno-carcinoma from one of these areas or in the neighbouring epithelium. Finally when the definite transition to
carcinoma has been effected in one of these little tumours, a tendency to undergo retrogression in the others which are consequently not prominent in the stage of developed cancer. Saint found that in the large bowel, the Sigmoid was by far the most frequent site of occurrence, and that the Adenoma was by far the most common type of Polypus encountered. This seems to explain why cancer is more common in the Sigmoid colon.

In the Latent stage cancer is definitely present but there are no signs of its existence even to the patient. The Pathological condition present, is either a cauliflower growth which has not yet begun to bleed, or ulcerate, or a constricting growth, the effects of which are being sufficiently compensated.

When we come to the stage of observable clinical manifestations, we see that cancer of the colon takes two main forms with correspondingly different effects. In one the effects are due to an ulcerating mass in the lumen - typified in Cases 2 and 4. In the other, to the progressive narrowing of the lumen by a constricting process - as seen in Cases 1 and 3.

A careful inquiry into the previous medical history is all important in cases of colonic obstruction.

The history of the case is explained by the course of events as follows: - The narrowing of the lumen at the site of the growth tends to delay the faecal
stream, but for a time compensation is effected by the hypertrophy of the bowel above the lesion. As the constriction advances, hypertrophy increases, and the more vigorous peristalsis thereby induced results in colicky pains. These pains are attended by ramblings of flatus made worse by purgatives. The colicky pains however may be put down to 'dyspepsia' as they follow on taking food. Dilatation follows hypertrophy, and the increase of back pressure tells more upon the Caecum which is thin-walled. Visible peristalsis may be seen. As long as the ilio-caecal valve is competent the small gut will not be affected and the typical 'ladder patterns' won't be met with. As a result of the stagnation in the dilated bowel the stools become offensive and intermittent attacks of diarrhoea may occur. Acute obstruction follows sooner or later as a result of the congestion and oedema at the site of the stricture, sometimes caused by taking opening medicine or from impacted faeces, or volvulus, or intussusception if in the mobile segments e.g. sigmoid colon.

**Diagnosis:** The diagnosis of a case can usually be arrived at by taking a careful history and noting the change in the patient's bowel habits, from regular to irregular. According to the nature of the growth and the segment of the colon involved the clinical picture will develop along the lines of a stenotic or ulcerative lesion. The altered shape of the
stools is not of much significance in the diagnosis since the formation of the stools takes place in the Rectum and Anus. Loss of weight and energy are late symptoms and it is important to note that the patient can often localize the site of obstruction himself. The examination per Rectum should always be done as it often reveals a growth at the distal end of the colon and also peritoneal metastes may be felt which would tend to contra-indicate operation. Ballooning of the Rectum is frequently found in tumours at the pelvi-rectal junction and is due to a disturbance in the nervous mechanism of that part as a result of the tumour growth higher up.

Examination of the stools will in nearly all cases show visible or occult blood, pus and mucus and fragments of tumour tissue according to the degree of ulceration. Among the signs or symptoms noted will be anemia, visible or palpable peristalsis local distension of the caecum and in some cases a palpable tumour. The Sigmoidoscope is of great value in diagnosing a growth and ulcerative colitis, adenomata and papillomata can be recognised when present in the lower half of the Sigmoid. The ordinary stethoscope will often give information of value by demonstrating the gurgling of gas through a narrow opening. Bimanual examination under an anaesthetic if necessary is often of value. In recent years the opaque enema has almost completely
superceded the opaque meal which added the danger of bringing on an acute attack of obstruction. It is advisable to check the findings of one enema by a second or third examination. If the stenosis is marked the enema will be completely arrested at site of obstruction and if it passes the obstruction the characteristic filling defect with dilatation of the bowel proximal to the growth will be seen. Local spasm and Pseud-filling defect caused by gas or extra-colonic lesions can be differentiated by giving the enema at considerable gravity pressure in conjunction with antispasmodics and forcible filling of the spastic segment by manual palpation.

**Diagnostic Difficulties:**

The ulcerating type of growth may be confused with inflammatory conditions of the colon which cause bleeding and discharge of mucous e.g. Colitis, Polyposis. The sigmoidoscope here should reveal the actual lesion in the pelvic colon. In ulcerative colitis the rigid bowel wall will give the typical x-ray appearance of a straight tube - the ribbon-like colon.

Diverticulitis may be mistaken: but here there is usually a history of over 20 years even, of recurrent attacks and fever with incomplete obstruction and pain or even swelling in the left iliac fossa.
Bleeding however rarely occurs. In the x-ray photo, rounded annular or crescentric shadows project beyond the general line of the lumen of the bowel, and after evacuation of the enema parallel rows of opaque spots due to retention of barium in the diverticula are seen. Cancer and diverticulitis may co-exist. Cancer of the Transverse colon may be mistaken for chronic intussusception owing to the existence of a movable tumour. The opaque enema will settle the diagnosis, the appearance after the evacuation of the enema in a case of intussusception being very striking.

Pericolic bands and any other abdominal tumour may give rise to some difficulty in diagnosis.

Tuberculosis becomes less and less common, the farther away one gets from the Caecum.

Treatment:

The treatment of colonic obstruction must be considered from the clinical standpoint: but first of all we must consider the operation of Primary resection.

Primary resection: - It is laid down as a basic principle of the treatment of acute obstruction of the colon that resection with immediate restoration of continuity (that is without drainage of the proximal colon) is an unjustifiable procedure. Primary resection with immediate union, however, can be
successfully carried out in the small intestine and is there the method of choice; the same procedure proves disastrous in the colon. The reason for this difference is explained by the much greater freedom with which resection can be done in the small bowel. Fairly healthy bowel at the site of union can be obtained and the ends brought together without tension. In addition the contents of the ileum are more fluid, move more rapidly and are less septic than those in the colon. But, to make an artificial anus in the small intestine is more serious than in the colon. In the ileo-caecal region the conditions approximate to those obtaining in the small bowel, and this is the only region of the colon in which primary resection followed by immediate anastomosis can be considered. Whenever resection of the colon is essential as in gangrene from volvulus or internal strangulation it must be combined with drainage of each end of the bowel, preferably by tying in a Paul's tube; and at a later date continuity may be restored. This two-stage operation of Paul and Mikulicz is sometimes advocated in acute colonic obstruction from malignant growth. The bowel concerned is mobilized, its mesentery divided between ligatures the whole coil brought outside the abdominal wound, which is then sutured closely around
its two limbs and a Paul's tube is fixed into each limb. Either at the time, or a few days later, the coil is cut away; still later continuity is restored either by the use of the enterotome to divide the "spur" or by direct suture. This operation is best restricted to gangrene of the colon. This method was used in a modified form in Case VI. If used for malignant growth obstruction the lymphatic glands are insufficiently dealt with. Caecostomy for the immediate relief of the obstruction is better and this can be followed up by complete excision of the bowel and lymphatic drainage area.

In cases of inoperable cancer of the colon the two alternatives are palliative anastomosis and colostomy. Ileocolostomy for obstruction of the colon carried out in cases where the ileo-caecal valve is competent entails a serious risk of later gangrene of perforation of the caecum. This is due to the tension caused by the gradual accumulation of intestinal secretions of intestinal secretions pent up between the ileo-caecal valve and growth. Caecocolostomy is the correct procedure in these circumstances and if ileo-colostomy is performed it must be combined with appendicostomy or caecostomy to prevent the tension.

In the treatment of acute colonic obstruction we may divide the cases into three groups as they present themselves prior to operation:
Group I  Where it is impossible to tell whether the obstruction is in the ileum or the colon.

Group II  Where it is possible to local the obstruction to the colon but its situation therein is not known.
Group III Where the site of obstruction in the colon can be definitely ascertained.

Group I.

With a careful physical examination of the abdomen, the diagnosis between large and small intestine obstruction can be arrived at. Strangulated external hernia can be recognised by the palpable swelling at a hernial orifice. Intussusception occurs most frequently in very young or in old patients. A careful inquiry into the previous history is helpful, the entire absence of any intestinal troubles prior to the onset of obstruction being in favour of the small intestine, bearing in mind the possibility of strangulation being caused in the small gut by adhesions from an old operation. The previous history of acute obstruction due to malignant growth is sufficient in diagnosis. Bulging in the flanks occurs in large gut obstruction, and especially when the ileo-caecal valve is competent. The central parts of the abdomen are distended, showing 'ladder-patterns' in small gut obstruction. The 'keynote' to the diagnosis is the condition of the caecum. If visibly distended or felt alternatively to harden and soften under the fingers, then the obstruction is distal to it. If investigation such as this fails, then the first step in operative treatment, except in most
severe cases, will be an exploratory laparotomy, carried out through a paramedian incision, splitting the fibres of the lower portion of the right rectus, and just large enough to admit the hand, and prevent escape of bowel. Caecum is felt for, and in colonic obstruction will be distended. Sigmoid colon is next examined, and if distended the condition is probably a volvulus or obstruction in lower sigmoid or Rectum. If collapsed, the omentum is next drawn down, and the transverse colon examined and if distended, the left half of the transverse colon. Splenic flexure, and descend colon, are palpated. If collapsed, the right half of the transverse colon, hepatic flexure, and ascending colon, are palpated. The gravity of the patient's condition may make, sigmoid and transverse colon examination, out of the question. If the caecum is distended - the incision should be closed and caecostomy performed through a 'grid-iron' incision in the right Iliac fossa, and a Paul's tube being tied into the caecum or a rubber tube as in Sim's operation of gastrostomy or by Lockhart Mummery's volvular method.

When the site of the obstruction has been located and tumour found, the next step is to find out the loc-
al fixity, the extent of glandular involvement and the presence of secondary deposits in the liver and
peritoneum, and to decide upon the possibility of future removal. If removal is decided upon the incision is closed and caecostomy performed.

If inoperable - short-circuiting is preferable to an artificial anus, whenever the bowel distal to the growth is readily accessible. If short-circuiting is impracticable then colostomy just above the growth is required. Every effort should be made to avoid caecostomy as a permanent state, owing to the troublesome excoriation of the skin that occurs around it from the fluid and irritating character of the caecal contents. When operability is not decided upon, wait for a time, and then do a laparotomy when the acute condition subsides - and if inoperable do a short circuit or a permanent colostomy, the temporary caecostomy being allowed to close. Local fixity of the growth is rarely a contraindication to radical removal.

In most desperate cases no attempt should be made to find the obstruction, but 'blind' caecostomy under local anaesthetic should be performed. The risk is taken of leaving a strangulated knuckle to perforate and cause death from peritonitis (a 1.5% risk).

Group II.

If the obstruction can be located to the colon but its actual site remains undetermined, then,
provided external hernia and intussusception can be excluded there is a 9 to 1 chance of the cause being a malignant growth and a 6 to 1 chance of its being on the left side. In very severe cases of this group, blind caecostomy is the best procedure. On the other hand in slight degrees of obstruction where there may be merely a temporary plugging of the lumen of the growth by a faecal mass, or a transient oedema of its wall and, where evidences of toxic absorption are wanting, there is a reasonable chance that with repeated enemata etc., the obstruction may pass away, allowing an exploration later on. The danger of temporizing like this is that of gangrene and perforation of the caecum, this portion of the colon being most affected by the increased intestinal tension quite irrespective of the site of the obstruction. Any localised tenderness over the caecum is therefore a strong contraindication to temporizing, and demands operative relief of the obstruction.

Between these two extremes comes the largest class, where although there is definite colonic obstruction, the general condition of the patient is not so grave but that there is a reasonable prospect of his being able to withstand a paramedian exploration to ascertain the site and nature of the obstruction. The question to be decided, is whether in these cases,
we should commence the operation with a paramedian exploration or content ourselves with a 'blind-caecostomy'. The advantages of blind-caecostomy are, that it is a safe operation - can be performed quickly and produces a minimum of shock. There is no interference with the growth, and no new adhesions are formed. The caecostomy opening is as far removed from the area of further operation as any artificial anus can be. It is a good safety valve, for further operation of resection, giving rest to the sutured bowel and minimising leakage. When not required it often closes spontaneously on removal of the tube. The disadvantages put forward are - that a condition which laparotomy would have disclosed may remain unrevealed and lead to death e.g. volvulus of the pelvic colon (1% chance.) and simultaneous obstruction of the large and small intestine, - that after blind caecostomy a second operation is always required if the patient survives and no data are available for information of the patient or guidance of the surgeon. Laparotomy allows permanent colostomy in correct position if the growth is irremovable - that it only provides efficient drainage for the colon in its proximal half. Where obstruction is in the pelvic colon distension and rupture of the gut may occur even after the caecum has been drained - that more
serious cases of obstruction die after relief of obstruction from a low grade peritonitis as a result of infected exudate from the bowel. Rapid exploration of the abdomen under gas and oxygen causes little risk if the bowel does not protrude. Surely the knowledge about the site, nature of obstruction, whether it is a growth or not, its local fixity, extent of glandular involvement and presence of secondary deposits, is far better acquired when caecostomy has caused all urgency to pass away, when the abdomen has become flaccid, and when the site of obstruction can often be determined beforehand by a careful physical examination, by sigmoidoscopy and by radiography after a barium enema. Even the most optimistic advocate of preliminary exploratory laparotomy in case of an existing Volvulus or Internal Strangulation necessitating as it does a general or spinal anaesthetic must admit that it would add more than 1.5% to the mortality.

There are two chief methods of performing a Caecostomy. The first method was adopted in Case I. A small grid-iron incision is made in the right Iliac Fossa down to the peritoneum. The distended wall of the caecum is located and sutured to the peritoneum with a purse string suture. A thin bladed sharp pointed knife is then pushed through the caecal wall, when a quantity of gas and fluid material comes out.
A rubber tube is put into the caecum for drainage and tied by means of a silk worm gut suture to the skin. The wound is packed with Iodoform gauze. The point to note in the operation is that the Caecum is not brought out of the wound, and the drainage tube is not tied in in a valvular manner.

The second method is that which is used by Lockhart Mummery, and is a valvular type of caecostomy. It was used in Case III. A small muscle splitting incision is made in the right lumbar region and the peritoneum opened. The Caecum is found and brought out of the wound and clamped. A hole is then made in it with a small thin bladed knife, and a rubber tube about \( \frac{1}{4} \)" in diameter is pushed into the caecum for 2". The tube is then stitched to the caecal wall with cat gut each stitch going through the wall of the tube and picking up the caecal wall \( \frac{1}{2} \)" away from the tube. When these are tied a cuff of caecal wall will have been turned in. A purse-string suture is then inserted, well away from the tube, and tied so as to turn in more of the caecal wall. The ends of the suture after being tied are brought through the aponeurosis and peritoneum, and one or two sutures placed so as to fix the caecum at the point at which the tube enters to the deep surface of the abdominal wall. Iodoform gauze
is then wrapped round the tube in the wound and the skin sewn up with 3 silk worm gut sutures. The advantages of this method are that it is cleaner and drainage through the tube is more certain. The danger however arises when the caecum has been greatly distended and may have begun to show gangrene. Any manipulation such as bringing it out of the wound may result in rupture. Again there is the danger of the Caecum bursting through the opening made in the peritoneum if it is very distended.

Group III.

Here the actual situation of the colonic obstruction is known usually because a growth has been discovered on rectal examination or in others a palpable abdominal tumour has been felt, or very exceptionally obstruction has supervened very shortly after a sigmoidoscope or a radioscopic investigation has disclosed its site. If rectal examination enables us at once to decide that the growth is definitely inoperable on account of local fixation to the bladder, prostate, uterus or sacrum, the correct procedure is - left lumbar colostomy, since, with a growth placed so low, a future palliative short-circuit is impracticable. If rectal examination does not contra indicate a future radical operation, a left paramedian incision to allow a hand in, can be done and the extent, fixity of
growth and degree of metastases determined. The operation is concluded by fixing a loop of colon into the wound and opening it either at once, tying in a Paul's Tube or a few hours later according to the severity of the obstruction. In very severe cases only a 'grid-iron' sigmoidostomy can be performed.

Where the growths are too highly situated to be felt per rectum - it is impossible prior to its exposure by laparotomy to exclude the possibility should it prove inoperable, of there being a sufficient and readily accessible length of bowel distal to it, to permit of a short-circuit operation, and thus avoid a permanent artificial anus. In these cases a blind-caecostomy for the immediate relief of the obstruction is advisable with later exploratory laparotomy.

**Note on De Morgan Spots.**

A De Morgan Spot or to give it another name a Telangiectatic spot is found on any part of the body but usually on the trunk and abdomen. It is a small bright red spot which is situated in the skin and is quite insensitive. A pin may be put into it without causing any pain.

**Pathology:** The spot is not an extravasation of blood into the tissues but is a local swelling at the end of a capillary vessel. The endothelial cells have pro-
Dealing with Proximal Colon Tumours: Commentary.

It is remarkable to what extent non-obstructing cancers of the colon can grow without producing definite symptoms. It may be that the accidental discovery by the patient, or by his doctor, of a lump is the first sign of the disease. It is at this stage too that the development of anaemia which is an almost constant feature of cancer of the proximal colon, is of special significance. An analogous form of secondary anaemia is found also in cancer of the stomach. This common tendency to anaemia in gastric and caecal cancers gives an added significance to the anatomical description of the caecum as a 'second stomach' (Keith). Experimentally it has been shown that in the caecum of the rat, there is a sphincter called the caeco-colic sphincteric tract, which has been compared with the Pylorus and pyloric canal. The caecum and stomach have been likened to each other in respect to the growths which occur most commonly in certain places. For instance the growth which arises from the fundus of the stomach is of the soft, fungating variety causing loss of weight, appetite and anaemia. A similar type of growth, with like symptoms is found in the caecum, in that part which is below the level of the ileo-caecal valve. The annular constricting type which occurs at the Pylorus, is also found at the caeco-colic junction.
Let us consider the effects of ulceration. The growth acts as an irritant and so new and deleterious elements are added to the intestinal contents such as, excess of mucous, small quantities of blood and septic material from the ulcer surface. The combined result of the presence of the irritating growth and the local accumulation of irritant material is to cause an increase in the functional activity of the bowel-diarrhoea, especially mucous diarrhoea. An equally characteristic effect of the ulcerative process is anaemia - and this secondary anaemia might almost be said to point to a caecal cancer, when there is no other obvious cause. The curious facts about this anaemia are firstly, that it can and does occur without visible loss of blood, even in the absence of occult blood, and secondly, that it is not such a menace from the operative standpoint as might be expected, and is in fact no insuperable barrier to a successful resection. As to its cause many theories have been exposed but there can be little doubt that it is largely due to constantly recurring loss of blood in small amounts from the growth, heightened by absorption of toxic material from the involved bowel. The size of the tumour and the degree of anaemia, has been shown to have a definite relationship. Alvarez has pointed out that caecal cancers
are bathed in the most highly infective fluid to be found anywhere in the body - a fluid full of organisms which, when injected into animals produces severe anaemia. Flint suggests, as a possible explanation, that urobilin may be normally absorbed from this region, and is altered in some way when disease starts here, so that it cannot take its proper part in the formation of Haemoglobin. We must take into consideration the situation of the growth in respect to clinical manifestations. In the proximal colon the growth is usually of the fungating cauliflower type and forms a definite mass. Because of its bulk and accessible situation it is palpable at a moderately early stage. Obstruction however in this segment of the colon is rare - owing partly to the nature of the growth, partly to the fluidity of the intestinal contents and also the wide calibre of the tube.

**Diagnosis:** The diagnosis of such a condition as this, is quickly arrived at and depends to a great extent on the history which the patient gives, and the physical signs. The profound anaemia is suggestive at once of a caecal cancer, or perhaps cancer of the fundus of the stomach, or of the rectum, since the patient is perfectly well otherwise. Associated with this anaemia we find tiredness and
loss of appetite the results of toxic absorption. The rumblings in the right Iliac fossa at once centre our thoughts to the abdomen and in particular to the caecum. Sometimes the patient complains of gastric upset - he gets an uncomfortable sensation in his epigastrium after taking his breakfast. There may be other signs of indigestion present and when this is so the presence of a growth in the Transverse colon should be kept in mind. From the physical examination we are greatly aided by being able sometimes actually to grip the tumour and roll it between the fingers and thumb. In some cases there are painful areas in the tumour in others absolutely no pain is felt.

**Differential Diagnosis:** Cases with a tumour in the right iliac fossa are to be distinguished from early actinomycosis, hyperplastic tuberculosis, and appendicitis. In actinomycosis there is loss of weight and anaemia, but it generally runs a febrile course. The palpable mass is less definite in outline and a radiogram may help to show its extra-colonic nature. Unless the clinical diagnosis is reasonably clear in Actinomycosis and in hyperplastic tuberculosis, we cannot expect much help from X-rays, and it is here we are often compelled to do an exploratory laparotomy. In appendicitis with chronic suppuration, the short history and local evidence of inflammation - the acute and sudden onset of pain and fever - should suffice to
used B.I.D. Some intestinal antiseptics may be
given in the week before operation - Kerol and Lactic
Acid ferment - the Bulgarian Bacillus, 2 tablets
of dried culture in sweetened milk T.I.D. before
meals. Examine the stools everyday for the
Bacillus, and then cut down the dose to \( \frac{1}{2} \). No
purge on the day before the operation. A mixture of
opium and Belladonna can be given on the night before.
No food on morning of operation - but a cup of weak
tea 3 or 4 hrs. before operation may be taken.

It is important to note that Castor Oil should
be given the night after a Barium enema has been
done, and an enema (soap and water) next morning to
empty the colon completely.

Operation:

Anaesthetic: Spinal Anaesthesia is extremely
useful in abdominal cases for anything below the
Umbilicus or even as high as the Gall Bladder. It
has many advantages among them being that there is
not the fear and trouble of an ordinary anaesthetic.
There is perfect relaxation and shock is small. But
it has also disadvantages, which, if overlooked may
lead to a fatal result. The Blood Pressure falls
considerably. Headaches may be present for a few
weeks after. The cord may be injured. Sometimes it
fails. The precaution to take, is to keep the
patient's head low all the time and raise the foot of the bed to prevent headaches after the operation.

The important points to note in the operation are, accuracy in suturing, perfect haemostasis, scrupulous cleanliness, free drainage, and absolute mobility of the colon involved.

The reason for having to remove such a large piece of bowel is because the vessels which are ligated supply a long stretch of bowel and it would be unwise to try to anastomose two pieces of bowel, which were in peril as to their nutrition. The bowel is cut by means of the 'cuff' method and a lateral anastomosis made between the end of the ileum and the Transverse Colon. Lateral anastomosis, or end to side anastomosis is the method generally adopted after resection of the caecal angle. It was found by experience that there were far more failures if axial union was performed in the Colon, though in the small Intestine it is the method of choice. The disadvantages of lateral anastomosis are firstly, that it requires a much greater length of bowel and consequently either more extensive freeing of the Colon or less extensive removal of the diseased portion as compared with axial union. Secondly the operation takes longer to perform as in addition to the actual anastomosis, the ends of bowel have to be sealed off.
Thirdly the subsequent anatomical condition is not a normal one and the blind end of the proximal portion of the bowel sometimes gives trouble from dilatation and pocketing beyond the stoma; in some cases this has even led to ulceration and abscess.

Post-Operative Treatment.

Raising the foot of the bed after operation prevents the headache following a spinal anaesthetic. If there is no colostomy opening made, the patient is kept on fluids without milk, and with as little residue as possible. Rectal salines should not be given after resection has been done but subcutaneous salines for 2 days may be given if thought necessary. It is best not to have the bowels opening till the 4th or 5th day after, and if there should be pains due to wind, 1 oz. of pure Glycerine may be put into the Rectum. Liquid Paraffin and Petrolagar given soon after the operation have been found very satisfactory and soon allow the bowels to settle down to an easy motion. If Castor oil is necessary, it should not be given till the 4th or 5th day. If the bowel needs a slight stimulant then $\frac{1}{2}$c.c. Pituitrin hypodermically or $\frac{1}{100}$gr. of Eserin — with an enema $\frac{1}{2}$ hour later should be tried.

A spinal anaesthetic may be given if a motion is desired, as it relaxes the sphincters. As a preliminary to resection of the growth, Wilkie advises
a course of vaccines, 10 days and 3 days before operation, since experimentally it protects the patient against $2\frac{1}{2}$ times the M.I.D. in B. Coli peritonitis.

5 c.c. of 5% Nuclein is given the night before to raise the leucocyte count.

Operation.

The whole secret in the operative technique is to obtain free mobilization of the colon. Shoemaker's clamps are extremely useful in performing the closed method of end to end anastomosis. The axial anastomosis is the method of choice in the case of the small intestine but owing to the fact that it has resulted in so many failures in the large intestine, it has to a certain extent been abandoned in favour of end to side or lateral anastomosis. Lockhart Mummery advises that the bowel be cut at an angle of $45^\circ$ from the mesenteric border outwards, as he believes failure is due to poor blood supply caused by cutting the bowel straight across. When leakage occurs after axial union of the colon it will generally be found to take place on the opposite side to the mesentery. The leakage is due to the sloughing of the edges of the bowel where they are stitched together and not to inadequate or faulty suturing. By Pannett's method the bowel ends are rotated before suturing so that two non-peritonealised mesenteric angles are not
opposite. The causes of failure to obtain primary union are:

(1) The wideness of the non-peritonealised segment of bowel along the mesenteric border.

(2) Poor arterial anastomosis.

(3) The solid nature and high infectivity of the contents of the large intestine.

The drawback to all the methods of anastomosis is that the actual mucous membrane is not sutured and so the vessels are not controlled. A partial diaphragm is left. The method of cutting the colic bands and the muscular coats to relieve all tension in the gut before doing the anastomosis is strongly to be recommended as it relieves all tension caused by the muscular bands after suturing. It should always be accompanied by a caecostomy opening to relieve the tension from within at the line of suture.

After Treatment.

The commonest error is too early and too frequent use of purgatives. Let the bowel rest. As soon as possible give $\frac{1}{2}$ to 1 oz. of liq. Paraffin morning and evening. Some say to get the patient on full diet within 3 days of the operation so that the bowels act normally after 3 or 4 days but this is often not possible as the patient takes a few days
to get back his appetite. It may be necessary to run in Olive Oil into the Rectum through a soft catheter.

Complications which may arise:

Leakage of the bowel contents through the sutures is most likely to occur between the 8th and 12th days after the operation.

A mild infection of the abdominal wound may take place and this will cause a slight rise of temperature. Stricture from adhesions to the raw area. This is avoided if some of the omental tissue is stitched over the raw areas.