Pattison Prize in Clinical Surgery.

*June 1942.*

Report and Commentary on Six Cases

submitted by,

William P. Small.
Preface.

The cases described in the following pages are examples of what has come to be known as the "acute abdomen". Such a grouping, under so vague a term is essentially clinical, and it is therefore proposed to lay more stress on the clinical aspect rather than on the underlying pathological conditions.

All six patients were admitted to the wards of the Royal Infirmary as emergency cases, and most of them underwent surgical treatment within the next few hours. It is perhaps true to say that the management of this type of case may call for a higher degree of surgical skill than any other. Most of the patients are urgently ill, and many are suffering severe pain. On these accounts, systematic examination may become undesirable or impossible, and a balance has to be struck between an over-zealous examination on the one hand, or an inadequate investigation on the other. The diagnosis has to be arrived at by means of the simplest of clinical tests, the surgeon relying almost entirely on his unaided senses, for little aid can be gained from the laboratory, or from the more time-consuming and more highly specialised methods of examination.

The decision as to the exact line of treatment to be followed has to be made rapidly, and in this respect, an estimation of the patient's general
condition and suitability for operation is of prime importance. Thus, no stereotyped routine can be followed, each case requiring to be judged on its own merits.

My thanks are due to Mr. F.E. Jardine for permission to record these cases, as well as for his constant encouragement; and to Mr. W.S. Tulloch for his most kindly tolerance and advice.

Many of the details of post-operative treatment were obtained from Sister Sibbald and the Nurses of Wards 17 and 18, and I wish to take this opportunity to record my acknowledgement of their willing co-operation.

June 1942.
Case 1.

Name of Patient:-- Barnett Friedman, Aet. 62.
Admitted to Wd. 18:-- 31/7/40
Complaint:-- Severe lower abdominal pain.
Diagnosis:-- Perforated diverticulitis.
Treatment:-- Modified colostomy.
Result:-- Recovery.
Case 1. Perforated Diverticulitis.

Patient's Name: Barnett Friedman. Male. Aet. 62
167 Gilmore Place,
Edinburgh.

Recommended by: Dr. Park.
112 Gilmore Place,
Edinburgh.

Admitted to Ward 18: July 31st. 1940.

Complaint: "Pain in the stomach" - duration 8 hrs.
Occupation: Salesman.

History of Present Condition.

At 9 a.m. on the day of admission to hospital, (31/7/40), the patient was seized by an attack of lower abdominal pain. The onset was sudden, and without warning, so that the patient felt as though he had been stabbed with a knife. Prior to the attack, he had felt perfectly well, and at the time of the attack, he was reading the morning paper.

At first, the pain was situated in the midline, in the lower half of the stomach. It was burning in character, and came in waves of increasing severity. The patient was compelled to lie down, and at the same time, he became aware of a dull ache in the back of the head. The whole body became covered with clammy perspiration, while the hands and feet felt cold and numb. Breathing/
Breathing was painful, so that the patient took as shallow breaths as possible.

About an hour after the onset, the pain became more general, involving the whole abdomen, although the point of maximum intensity was still in the midline, below the umbilicus. The patient applied hot water bottles, but they failed to give relief.

About two hours after the onset, there was another severe attack of pain, still situated in the lower abdomen, but this time appreciably to the left of the midline.

At no time did the patient vomit, although there was an intense feeling of nausea. He tried to induce vomiting by stimulating the back of the throat, but without result.

The bowels have been perfectly regular until the morning of the day of admission, when they became constipated, and since then they have not moved. The motions have always been well formed, and the patient has never noticed any abnormality in their appearance.

There has never been any urinary disturbance, either prior to, or during the present illness.

The appetite has always been good, and there has been no loss of weight.

**Previous Illnesses.**

Pneumonia while a child.
Family History.

The patient has two brothers, both of whom are alive and well.

Father and Mother are both dead, the causes of death being unknown to the patient.

Habits.

The patient is a heavy smoker of cigarettes, consuming about thirty per day. As a result of this habit, he has a chronic cough.

He consumes very little alcohol.

Examination on Admission. 31/7/40

T.P.R. 99.4 degs. F. 90/min. 20/min.

General Appearance.

The patient was a small, lightly built man, with a thin drawn face. He lay very still in bed, and was obviously in great pain.

Originally of Russian nationality, the patient spoke a broken English which, at times, was very difficult to understand. Great care had to be exercised in the use of leading questions, since the patient was very open to suggestion.

Alimentary System.

The tongue was heavily furred, and the breath foul. There were no natural teeth, and, although he possessed them, the patient never used false teeth.
On inspection of the abdomen, very little movement with respiration could be detected, breathing being almost entirely thoracic in type. There was no obvious distension of the abdomen, nor were there any abnormal swellings to be seen. There were no protrusions through any of the hernial orifices.

On palpation, the whole of the lower half of the abdomen was found to be tender, and definite rigidity and muscle guarding could be demonstrated. Tenderness was most marked at a point in the midline, an inch below the umbilicus, and here also, rigidity and muscle guarding were maximal.

On light percussion, a moderately dull note was obtained. The presence of shifting dullness could not be demonstrated.

No areas of hyperaesthesia were detected.

Rectal Examination: Much pain was elicited anteriorly, in the pouch of Douglas, and on the left side. The rectum was ballooned, and contained some hard faecal masses. The prostate was moderately enlarged.

Respiratory System.

The chest was narrow and under-developed. Expansion was reasonably good, although the patient was unwilling to take deep breaths. On percussion, no areas of dullness were elicited, on auscultation, a few moist rales were heard at both bases.
Central Nervous System.

Both pupils reacted equally to light and accommodation.

Knee and ankle jerks were present and active.

Cardio-vascular System.

The pulse rate was increased, (90/min.), but the pulse was of good volume, and regular in time and force. The vessel wall was palpable at the wrist.

The heart was not enlarged, and the valve sounds were closed in all areas.

Urinary System.

No abnormality was detected. Examination of the urine revealed no abnormal constituents.

From the above history and examination, no definite diagnosis was arrived at, although disease in the pelvic organs was certain.

The patient was kept under close observation in bed, the pulse being taken hourly.

After some hours, the abdominal pain increased in severity, and the patient became very restless, tossing and turning in bed. Morphia was, however, withheld, lest any change in the patient's condition were masked.

On re-examination: It was found that the pain was now of maximum intensity at a point situated in the left iliac fossa.

Examination of a further specimen of urine failed to reveal any abnormal constituents.
A provisional diagnosis of perforated diverticulitis and peritonitis was made.

In the absence of Mr. Jardine, the opinion of Mr. Quarry Wood was sought, and he advised immediate laparotomy.

**Summary of the main points in the history and examination.**

1. Sudden attack of severe abdominal pain.
2. Pain stabbing in character, and situated in the lower abdomen, at first in the midline, and later shifting to the left iliac fossa.
3. Patient collapsed, with drawn anxious face, and sunken eyes.
4. Generalised tenderness in the abdomen, with muscle guarding and rigidity on both sides, below the umbilicus. Later the pain and tenderness were more pronounced in the left iliac fossa.
5. Tenderness in the pouch of Douglas and anteriorly, and on the left side, on rectal examination. Hard faecal masses were also felt.
6. No abnormality detected in any of the other systems.
7. Total duration of symptoms, on admission, 8 hours.
Operation. 1/8/40. 11.30 a.m.

Premedication: Morphine grs. 1/4, atropine grs.1/100
Anaesthetic: Chloroform and ether.
Surgeon: Mr. Quarry Wood.
Operation: Laparotomy.

The abdomen was opened by means of a lower left paramedian incision. As the peritoneum was exposed, it bulged forward into the wound, and the peritoneal vessels were seen to be engorged.

On opening into the cavity, a quantity of foul-smelling thin pus escaped, and as much as possible was removed with a suction tube. The gloved hand was then passed through the wound in
the hope that palpation would reveal the site and nature of the disorder.

The pelvic colon was filled with hard faecal masses, and, near its lower end, a resistant swelling was palpated. On withdrawing the hand, the fingers were seen to be soiled with faecal matter. Carcinoma of the colon was feared to be the cause.

Some faecal matter was removed from the peritoneal cavity manually, and with forceps and swabs, and the rest of the abdominal cavity was then packed off. An endeavour was then made to bring the hard mass, previously palpated, into view, a procedure made unusually difficult by the abnormally solid content of the pelvic colon.

It was seen that there existed a state of diverticulitis of the colon. Many pouches were present in the wall of the gut, and there was also a generalised thickening and fibrosis of the muscle coats. About 2-3 inches from the pelvic-rectal junction, a diverticulum was revealed, in which was a perforation, about the diameter of a pencil. Through this opening there projected a piece of faeces into the peritoneal cavity. This projection was felt to be part of a faecal mass about the size of a walnut.

The perforation was then enlarged and this mass removed with forceps. Following this, as much as possible of the contents of the pelvic colon was removed. This manoeuvre made the bowel more freely mobile, although it was only with difficulty that the perforation was then brought up to the
opening in the peritoneum.

Following this, the intra-abdominal swabs were removed, a tube passed into the pouch of Douglas, and the edges of the perforation stitched to the edges of the peritoneum with catgut. Since there was considerable tension on these sutures, a pair of Allis's tissue forceps was attached to the bowel, just above the perforation, and allowed to protrude from the wound. A swab was packed into the space between the peritoneum and the posterior wall of the rectus sheath, to promote adhesions, and prevent any process of infection spreading from the opening into the surrounding tissues.

A corrugated rubber drain was left in the wound, and the surrounding abdominal wall was then reconstituted, 20 day catgut being used as suture material. The extremities of the skin wound were approximated with interrupted s.w.g. sutures.

The patient's condition after operation was only fairly good, the pulse being weak and thready.

Post-operative Treatment and Convalescence.

1/2/40. Operation at 11 a.m.

On returning from the theatre, the patient was placed in a warm bed, and propped up in a sitting position. In addition to blankets, warmth was applied by means of hot water bottles, and an electric shock cage. The head of the bed was raised on blocks.

10 c.c. of Soluseptasine (May and Baker) were
given intra-venously. Thereafter, 2 tablets of M. & B. 683 (7½ grains each) were given 4-hourly.

2/8/40. The patient's condition was very satisfactory. He was very thirsty, and was given plenty milk, water, and fruit drinks. The tongue was heavily furred, and the breath foul. The Allis's forceps, supporting the bowel were removed.

3/8/40. The thirst was still marked. The swab packing in the wound was removed. The patient's general condition still showed improvement.

4/8/40. In the morning, the patient was sick. This was considered to be due to the tablets of sulphonamide. These were stopped, and another injection of Soluseptasine, (5 c.c. intravenously) was given. The patient developed a troublesome cough, with copious sputum. Coarse crepitations were now more noticeably present at both bases. Mist. Ammon. Carb. 1/2 oz. T.I.D. was prescribed.

5/8/40. The drainage tube was removed. The patient's condition was very satisfactory.

6/8/40. Until today, the patient's diet had been fluid, being made up entirely of water, fruit drinks, milk, and clear soups. He was now allowed a light diet, consisting of milk puddings, chicken, rabbit, sponge cakes, etc.

7/8/40. When the wound was dressed in the morning, there were signs of inflammation in the upper part of the incision. A Mag. sulph. soak was applied. In the evening, there were signs of faeces on the dressing. From, and around the
corrugated rubber drain, semi-solid faecal matter was oozing.

As yet, the patient had no appetite for more solid food. No medicine had been given to open the bowels. The patient still had a troublesome cough, and crepitations were still present at both lung bases.

14/8/40. The patient had continued to progress throughout the week. Faecal matter was discharging satisfactorily through the abdominal wound. Although much improved, there was still some infection of the tissues in the neighbourhood of the opening. Mag. sulph. were still applied, and they had caused the discharge of a quantity of thin pus.

The patient was still nursed propped up in Fowler's position, but today, the blocks were removed from the top of the bed. The corrugated rubber drain was removed from the wound when it was dressed in the morning. Mist. Ammon. Carb. was being given t.i.d. for the productive cough, which was only a little improved. This lack of improvement in the chest condition was mainly due to the amount of tobacco that the patient consumed.

The patient's diet continued to be light.

20/8/40. The bowels were inclined to be constipated, and, as yet, there had not been much passage of stools by the normal route. Accordingly, liquid paraffin, 1/2 oz. t.i.d. was prescribed.

24/8/40. Today, the stitches were taken out, and/
and one large s.w.g. stitch was passed across the colostomy opening. This stitch was left untied. It was intended to be tightened gradually as the colostomy closed. Above and below the opening, the wound had healed perfectly, and, as all infection seemed to have vanished, the soaks were discontinued.

The liquid paraffin had effectively opened the bowels, and most of the faecal matter was now being passed per vias naturales. Mist. Ammon. Carb. was still being given for the cough, which was certainly improving. The diet continued to be light.

25/8/40. The liquid continued to act well, but the patient complained of discomfort in the rectum, and a continual desire to go to stool. A finger was passed into the rectum, where some hard scybalous masses were felt. It seemed that the daily motions passed over these masses, and that the paraffin had failed to dislodge them. Several olive oil enemata were given, without any very satisfactory result.

26/8/40. The masses in the rectum were removed digitally. This operation relieved the discomfort and slight pain which the patient had experienced in the past few days.

27/8/40. The patient was discharged to Convalescent House.

24/9/40. The patient was seen as an out-patient. The wound was almost healed.

27/11/40. The wound was closed, and the patient’s condition satisfactory. To return to work.
Case 1.  Perforated Diverticulitis.

Discussion.

History.

Prior to the onset of acute symptoms, the patient stated that he had always felt perfectly well. There had never been any abdominal pain or discomfort, and constipation or irregularity of the bowels had not been a complaint. Nor had there been any general symptoms such as malaise, intermittent pyrexia, or loss of weight.

As has been stated previously, the patient was very open to suggestion, and great care and discrimination was necessary in questioning him. He was quite emphatic, however, that he had experienced no symptoms. Although this was probably correct, the following factors must be kept in mind:

1. On admission, it was obvious that the patient took no great interest in his general condition. There was much ingrained dirt distributed over the face and body. As his occupation was not particularly dirty, it was evident that the application of soap and water played no great part in his daily routine. The finger and toe nails were long and uncared for. No artificial teeth were worn, and the interior of the mouth was lined with a heavy fur. It was not his custom to indulge in a daily shave.

All these findings, although in themselves trivial, suggest that the patient was not much
interested in his health or general well-being. It is quite possible that vague abdominal discomfort or pain would pass un-noticed by him, for it is well known that the appreciation of mild symptoms varies widely in different people.

2. The patient stated that he had not previously suffered from constipation. This statement was in no way borne out by the subsequent investigations. The colon was found at operation, to be filled with hard inspissated faecal masses. In the post-operative period, liquid paraffin was administered daily, and several scybalous masses finally collected in the rectum, and had to be removed manually.

Thus, it would appear that the patient's statements must be treated with some reserve, although it is obvious that no very severe symptoms, apart perhaps from constipation, can have been present previously.

The onset of acute symptoms was dramatic. There were four main complaints:-

1. Pain. The sudden onset of acute stabbing pain is a very constant feature in perforation. Its nature is well illustrated both in this case and in the following one,—perforated jejunal ulcer. In both instances, the patient was carrying out his usual routine when he felt "as though he had been stabbed with a knife". Such a comparison was made by both patients.

Pain is the most constant symptom in acute peritonitis. In this case, it was first experienced
in the lower abdomen, and later, in about an hour, it became generalised, and slightly less severe. In another hour, there came a second severe attack, again hypogastric in situation, but now more appreciably on the left side.

Thus, the site of onset of acute stabbing pain may be of importance, for it may indicate the approximate site of the perforation. There are exceptions to this generalisation, for occasionally, pain may be generalised from the outset, or rarely, it may be slight from the outset. A gradual diminution in the severity is also commonly seen, and it is accompanied by an improvement in the general condition, so that the patient feels much better. The cause of this phenomenon is said to be due to the toxaemia resulting in depression of the nervous system. There is no need to emphasise the dangerous nature of this change, and the need for extreme care in order to avoid misdiagnosing the condition.

It will be noted that, at first the pain was appreciated mainly in the midline, and that only later did it shift to the left iliac fossa. Pain, referred to the midline, especially in the region of the umbilicus is a common complaint in lower abdominal conditions. Thus, in appendicitis, the patient typically complains of pain beginning at the umbilicus and later shifting to the right iliac fossa. So frequent an occurrence is this, that it is given a prominent place in many textbooks, and its demonstration has even attained the dignity of a
Similarly, in abdominal distension, pain is principally felt at the umbilicus. This feature is illustrated in Case 3, carcinoma of the pelvic colon.

The time of onset of this patient's pain was 9 a.m., about an hour after his breakfast. It is interesting to consider whether or not, it might be associated with any physiological increase in the activity of the colon. We know from the experts on Public Health, who make it their duty to study such intimate details, that such a time is the most common for movement of the bowels to take place.

2. Collapse. Closely following the onset of the initial symptoms, followed those of collapse. The patient felt generally unwell, coming out in a cold sweat, and experiencing numbness and coldness of the extremities. The rapid onset of these symptoms makes it obvious that they could not have been due to a bacterial cause. Initially, the outpouring of fluid causes a mechanical irritation of the peritoneum, so that the symptoms are the result of a "peritoneal shock", rather than of a peritonitis. This shock passes off, to be replaced later by the collapse associated with a true bacterial peritonitis. The onset of this latter condition will obviously vary with the site of the perforation, and the nature of the contents of the diseased bowel. Thus, the general condition of this patient did not deteriorate with the same rapidity as is seen in
cases of perforated appendicitis. Although, he was not admitted to hospital until 8 hours after the onset of his condition, the pulse rate was not unduly elevated, 90/min., and there were no gross signs of shock.

3. **Difficulty in Breathing.** The patient complained of pain on respiration, so that he was compelled to take shallow breathes. This is an almost constant finding, and is seen most markedly in cases of perforated duodenal ulcer, where there is the added factor of direct diaphragmatic irritation.

4. **Nausea.** The patient had an intense feeling of sickness, so much so that he tried to induce vomiting in order to gain relief. It would appear that this symptom must be of the nature of a reflex nervous mechanism, for it occurs within so short a time after the initial onset of symptoms. Vomiting is usually a much later manifestation, and is typically associated with the onset of intestinal obstruction due to toxaemic paralysis.

**Examination.**

Abdominal tenderness was found, at first generalised, and later mainly in the left iliac fossa. Associated with it was marked rigidity. Tenderness is the abdomen is said to be due to irritation of the intestinal mucosa, while rigidity is a reflex nervous phenomenon, consequent upon irritation of the peritoneum. Of the two signs, tenderness is undoubtedly more important, for it is a more valuable localising sign. Even where widespread
tenderness is present, it is usually possible, as it was in this case, to determine the site of maximum intensity.

In addition to those signs, already mentioned, rectal examination gave valuable additional information:—

1. Tenderness of the pelvic peritoneum. This finding is always of great importance. In this case, it indicates that the irritation had spread to the pouch of Douglas. Pain was also experienced by the patient when the examining finger was directed towards the left side, indicating that the causal lesion was probably close to the left side of the rectum.

2. Palpation of faecal masses. This gave a clue to the nature of the condition, for diverticulitis is associated with severe chronic constipation.

3. Ballooning of the rectum. This sign usually suggests obstruction high up in the rectum, or in the pelvic colon. Taken in conjunction with the previous findings, one might be justified in assuming that it was due to the occlusion of the lumen of the colon by faecal masses or neoplasm.

Thus, rectal examination yielded most valuable results, from which the following inferences could be drawn:—

a. There was definite proof of peritonitis.

b. The cause was probably to be found in the region of the left iliac fossa.

c. Constipation had been associated with the condition.
Operative Findings and Treatment.

The patient was kept under observation for some hours, during which time, the signs and symptoms became more definitely located in the left iliac fossa. The general condition of the patient much improved under the influence of rest and warmth.

At operation, a perforation in the pelvic colon was found, in association with the presence of diverticulitis. Faecal matter was found in the peritoneal cavity, and the actual perforation was plugged by a scybalous mass.

The occurrence of perforation, with a generalised peritonitis is not commonly associated with this condition. More frequently, the actual diverticulitis causes symptoms, forcing the patient to seek advice, or, if perforation occurs, it is with the formation of a localised abscess.

The treatment in this case was to perform a modified colostomy, by uniting the margins of the perforation to the edges of the parietal peritoneum, and, in addition, the peritoneal cavity was drained. K.W. Mansarrat, (Brit. Med. Jour. 1928 ii 41), in a description of 4 cases with this complication, employed either excision of the diverticulum with drainage, or just simple drainage. Others advise drainage combined with colostomy performed at a higher level. Here, the colostomy may have to be of a permanent nature.

The method chosen in this case was completely successful, for, not only was the perforation
effectively dealt with, but a permanent colostomy opening was avoided.

Post-operative treatment, and progress.

The patient made very rapid progress after operation, and even within 24 hours, showed a very marked improvement. One might seek to find the explanation for this dramatic recovery among the following possible reasons:

1. Although peritonitis was present, and some free pus and faecal matter was found in the peritoneal cavity, the organisms were probably of low virulence. The source of infection was the pelvic colon, where the organismal content is less active than in other parts of the large intestine. Combined with this, is the fact that there was marked inspissation of the colonic contents. This would further reduce the number and virulence of the bacteria present.

2. The peritoneal infection was mainly situated in the pelvic region. The pouch of Douglas has lower absorptive powers, as compared with the rest of the peritoneal cavity. Thus the general effects of a pelvic peritonitis are less severe than in a more generalised type of infection.

3. At operation, a plug of faecal matter was found in the perforation. Whether or not this totally occluded the opening is not certain, but it would at least lessen the amount of intestinal contents escaping.

4. The whole descending colon was filled with hard faecal masses. Thus, only the contents immediately
adjacent to the perforation were in a position to escape from the bowel.

5. The perforation was made to drain directly to the exterior. Thus, the source of peritoneal infection was completely removed, whereas, if the colon had been left in situ, and a drainage tube passed down to the site, the original source of infection would still be present.

6. Sulphanilamide and sulphapyridine were administered. How much these drugs influenced the result, it is difficult to say, but the fact remains that they have a very powerful action in B. coli infections.
Case 2.

Name of Patient:— Duncan McGregor. Aet. 39.

Admitted to Wd. 18:— 12/10/40.

Complaint:— Severe abdominal pain.

Diagnosis:— Perforated jejunal ulcer.

Treatment:— Operative closure of perforation.

Result:— Recovery.
Case 2.  

Perforated Jejunal Ulcer.

Patient's Name: Duncan McGregor. Aet. 39  
115 Dumbiedykes,  
Edinburgh.  

Recommended by: Dr. Wyllie Thomas.  
13 Strathearn Road,  
Edinburgh 9.  

Admitted to Ward 18: October 12th. 1940.  

Complaint: "Pain in the stomach" - duration 5 hrs.  
Occupation: Barman.  

History of Present Condition.  

The patient was seized with severe  
abdominal pain at about 10 p.m. on the night of  
admission, (11-12/10/40.) The onset was sudden and  
without warning, so that the patient felt as  
though something sharp had been stuck into him.  
At the time of the attack, the patient was standing  
at his work, and the pain was such that he had to  
sink to his knees, and gasp for breath. He felt  
sick and shivery, becoming covered with a cold  
clammy perspiration. He managed to go home, and get  
to bed. Every movement caused intense agony, and  
he had to walk in a doubled up position.  

The pain was mainly situated in the lower  
abdomen, radiating to the loins, and round to the  
back. It never shifted in position, and varied only  
slightly in intensity. It was tearing in character,  
and was so severe that he was unable to pass water.
The patient became exceedingly breathless, and at each inspiration, the pain was intensified.

There was great nausea at first, later giving way to actual vomiting. The patient was sick at about 2 a.m. and again soon afterwards. The vomit was dark brown in colour, but not very copious, since the patient had had no food since the previous afternoon. Soon after the vomiting started, the patient was seen by his doctor, who sent him straight to hospital.

**Previous Illnesses.**

The patient has been troubled with his digestion ever since he was eight years old. At first, he had periodic attacks of pain, associated with nausea and loss of appetite. The symptoms gradually became worse, and constipation and melaena developed.

In 1926: The patient was admitted to the R.I.E., when he was 26 years of age. A posterior gastro-enterostomy was performed by Mr. Wade. The following is an extract from the case notes made at that time:-

**Duncan McGregor, Aet. 25 yrs.**

**Complaint:** Attacks of epigastric pain, occurring at long intervals.

**History:** The patient has had abdominal discomfort for about 17 or 18 years. The attacks occur at intervals of from several months to a year; the last attack before the present one being 10 months.
ago. They usually last for 1 to 3 weeks, during which time, the pain occurs every day. The last attack has been the worst of all, and has lasted for 5 weeks.

The pain comes on about 2 to 3 hours after food. It consists of a gnawing pain, situated in one spot, above the umbilicus, in the midline, and remaining there during the attack. On one occasion, he had an attack of stabbing pain in the right side of the back.

Vomiting occurs in about half of the attacks, and follows the pain. At the beginning of the present attack, the patient was sick for 2-3 days on end. The vomited matter is usually green and slimy.

The patient has noticed his stools being dark and often black, even before he started taking medicine.

The pain often wakes the patient up at night. It is relieved by food. No particular kind of food seems to bring it on, and the patient does not have to restrict his diet.

**Examination:** This was negative, except for slight abdominal rigidity and tenderness to deep pressure in the midline, a hands-breadth above the umbilicus, and also under the right costal margin.

**Operation:** 4/11/26. Mr. Wade.

Left paramesial incision made, and the abdomen opened. The first part of the duodenum was examined, and on its posterior aspect, white
scarring was found, indicating the presence of a duodenal ulcer.

A posterior gastro-enterostomy was performed.

After operation, the patient's chest caused some trouble, but this soon cleared up, and thereafter, the recovery was straightforward. The patient was discharged, cured, on 23/11/26.

After being discharged from hospital, the patient was given a diet, to which he was to adhere for six months. The diet consisted mainly of rabbit, chicken, boiled fish, eggs, milk, and milk puddings. The patient states that he kept closely to this diet for the prescribed time. Thereafter, he took a more varied diet, but was always careful to eat sensibly, and in moderation. His choice of food was to some extent limited by the question of expense, since the diet outlined above put a severe strain on his resources.

Living along these lines, he managed to remain quite well for about 6 years, when he began to get recurrences of his old symptoms. These gradually became more frequent and more severe, until in 1937, he had a sudden haematemesis. On account of this, he was admitted to Ward 26, under the care of Dr. Cowrie. The following are extracts from the notes made at this time:—

Complaint: Epigastric pain and sickness of 8 weeks duration.

History: In early June, 1937, patient started with epigastric pains. They came on at any time of day,
during intervals between meals, and temporarily relieved by the taking of food. There has been frequent heartburn, retching, and sickness. He vomits from time to time, bringing up chiefly bile-stained, acid fluid. He has never noticed food taken the day before in the vomit.

On the night of admission, (28/7/39), he vomited about 1/2 pint of dark brown blood. This was the first striking attack of haematemesis he has had, although he has noticed occasional spots of altered blood in the vomited matter. On a few occasions, he has passed black tarry stools. His appetite has fallen off considerably during the last month, and he has lost 9 lbs. during the same period.

**Treatment and Progress:** On admission, the patient was put on a dietetic regime comprising 50% glucose saline with orange juice. On the third day, milk was added, and thereafter, the Sippy diet system began. Under this treatment, the patient's condition improved considerably. He was discharged on 18/8/37. A strict ulcer diet was laid down, to which he was to stick for several years, and he was told to give up smoking entirely.

After leaving hospital, the patient has felt very well, except for occasional attacks of indigestion, which he relieved with powders.

A few weeks ago, he again had severe pain and indigestion, which led up to the attack
Gastro-intestinal Analysis.

Duncan McGregor.

Fractional Test Meal.

Fasting Juice.

Volume: 9 ozs.

Free HCl: absent.

Total acid: 20%

Cells: None.

Stomach. - gastro-enterostomy is functioning normally. No stomal ulcer. Duodenum. - deformity of D.C. No crater seen. The lumen is narrow. Very little barium leaves the stomach via the duodenum.
necessitating his admission to Ward 18.

Other Illnesses

During childhood:— Measles, Scarlet fever, Diphtheria.

In 1909, operated on for right inguinal hernia.
In 1920, operated on for left inguinal hernia.
In this year also, he had an attack of pleurisy.

In 1924, he had symptoms of acute appendicitis, which also gave rise to urinary symptoms. The symptoms cleared up, and no operation was undertaken.

In 1931, he had an attack of pneumonia.
He has had several attacks of tonsillitis.

Family History.

Father: Died at the age of 62 from a spinal tumour. For many years, he had suffered from "wind".

Mother: Alive, aged 67. Has been operated on for renal calculus. Now suffers from hypertension.

Brothers: There are two brothers, aged 45 and 24. Both are well.

Sisters: There are two sisters, aged 37 and 35. The younger of the sisters has suffered from trouble similar to that of the patient for a considerable time.

Social Conditions and Habits.

The nature of the patient's work, (barman), entails long hours of standing, often without food. His hours of work are:— 9 a.m. to 1.30 p.m., and 4.40 p.m. to 10.40 p.m. Lunch thus forms his
only reasonable meal of the day.

Owing to matrimonial difficulties, the patient's home conditions are unsatisfactory, his meals being often ill-prepared and indigestible.

For the past few years, the patient has been smoking on an average, about 30 cigarettes per day. He states that his consumption of alcohol has never been heavy, since he has found that it does not agree with him. In particular, beer causes him pain in the stomach.

Since the war, (1939), the patient's job has been heavier, and has carried with it increased responsibility.

Examination on Admission. 12/10/40.

T.P.R. 99.4 degs. F. 80/min. 32/min.

General Appearance.

The patient was a pale faced, poorly developed, young man, obviously suffering great pain. The features were drawn and pinched, the eyes sunken in their sockets, and the body and forehead bathed in a heavy perspiration. The extremities were cold to the touch, and the patient looked cold and shivery. He lay on his back, with his knees drawn up, frightened to move, and frightened to breathe at all deeply.

Alimentary System.

The tongue was dry and furred, and the breath foul. There were no natural teeth, the
patient possessing an efficient pair of false teeth which he used.

On inspection of the abdomen, no movement on respiration could be detected, breathing being shallow, rapid, and purely thoracic in character. The abdomen was flattened and retracted. No abnormal swellings were visible, and there were no protrusions through any of the hernial orifices. Several old operation scars were present, one in each inguinal region, and one in the upper abdomen.

On palpation, there was board-like rigidity of the whole abdomen. Great tenderness was elicited in both iliac fossae, and also in the right hypochondrium. It was difficult to say where the tenderness was maximal.

On light percussion, slight diminution of liver dullness could be demonstrated. There was a dull note on percussion of the flanks, and when the abdomen was shaken gently from side to side, the movement of fluid mixed with gas could be appreciated.

No areas of hyperaesthesia could be found. Rectal Examination: No abnormalities were to be found. There was no tenderness of the pelvic peritoneum, and no fullness of the pouch of Douglas could be elicited.

Respiratory System.

The chest was well formed, and moderately well developed. Expansion was markedly restricted on account of the severe abdominal pain.
On percussion, no areas of dullness were revealed, and no abnormalities were detected on auscultation.

**Central Nervous System.**

Both pupils reacted equally to light and accommodation.

Knee and ankle jerks were present and active.

**Cardio-vascular System.**

The pulse rate was slightly increased, (80/min.), but the pulse was of fairly good volume, and regular in time and force. The vessel wall was not palpable.

No enlargement of the heart was present, and the valve sounds were closed in all areas.

**Urinary System.**

No abnormality was detected, and examination of the urine failed to reveal any abnormal constituents.

From the above history, past history, and examination, perforation of a jejunal ulcer was suspected.

**Summary of the main points in the history and examination.**

1. Sudden attack of severe abdominal pain, followed later by nausea and vomiting.
2. Pain situated mainly in the lower abdomen, and radiating to the loins, and round to the back.
3. Long history of digestive trouble, punctuated by an attack of haematemesis.
4. Posterior gastro-enterostomy performed in 1926.
5. Patient collapsed and in great pain at the time of examination.
6. Board-like rigidity of the abdomen, and great tenderness everywhere.
7. Diminution of liver dullness, and free fluid present in the abdominal cavity.
8. No abnormality detected in any of the other systems.
9. Total duration of symptoms on admission, 5 hours.
Operation. 12/10/40. 4.30 a.m.

Premedication: Morphine grs.1/4, atropine grs.1/100
Anaesthetic: Nitrous oxide, oxygen and ether.
Surgeon: Mr. Tulloch.
Operation: Closure of perforation, and drainage of peritoneal cavity.

An incision was made to the right of the midline, extending from the level of the umbilicus to just below the costal margin, and the abdomen opened. On opening into the peritoneal cavity, much free fluid escaped, and it was seen to be of a blood-stained character. A considerable quantity was removed by means of swabs and suction. The peritoneum itself was seen to be reddened and congested.

The transverse colon and the mesocolon were identified. Numerous vascular adhesions running to the old abdominal wound were present, and these had to be divided and ligated. By means of the transverse mesocolon, the junction between the stom-ach and jejunum was located. A perforation, about the diameter of a straw was seen in the posterior part of the jejunum, just below the level of the anastomosis. The surrounding tissue was thickened and oedematous, and a hard fibroesd ulcer could be felt.

The perforation was closed with parallel sutures of catgut. The wound was closed in layers, a rubber tube drain being inserted to drain the
Duncan McGregor.

Very diagrammatic representation of lesion.
peritoneal cavity. The skin edges were approximated with interrupted s.w.g. and continuous Scotia sutures.

The patient's condition after operation was moderately satisfactorily.

Post-operative Treatment and Convalescence.

12/10/40. Operation at 4.30 a.m.

After operation, the patient was placed in a warm bed, and was supported by means of pillows in a high Fowler's position. Blocks were put under the head of the bed.

13/10/40. The patient's general condition was much improved, and he was fairly comfortable. Towards the evening, he began to be troubled with a slight cough, and his pulse rate increased. The cough caused him a considerable amount of abdominal pain.

14/10/40. The patient had been unable to sleep without the aid of sedatives. His cough was more severe, and there was some breathlessness. A mixture containing iodide and lobelia was prescribed. The patient was given milk to drink, and water to relieve the thirst. The tongue was moist, but still very furred.

15/10/40. The cough was less severe, and the patient was able to sit up and read the paper. Examination of the chest revealed the presence of diffuse rhonchi and crepitations. The patient was put on to a light diet, containing eggs, fish, chicken, etc.

16/10/40. Flatulence and abdominal pain were
complained off, but were considerably relieved after the administration of a flatus enema. The patient had not as yet much appetite.

17/10/40. The patient felt much better. Very little was escaping from the drain in the peritoneal cavity. Milk of magnesia, 1/2 oz. t.i.d. was prescribed. The chest condition was showing marked signs of improvement.

20/10/40. Satisfactory progress had continued. The patient had managed to sleep well each night, and was able to take an interest in his food and his surroundings. As he was very pale, and some degree of anaemia was present, iron was administered in the form of tab. ferrous sulph., 6 grains being given t.i.d.

21/10/40. The tube drain was removed, and a small rubber dam drain inserted to drain the layers of the abdominal wall around the wound. As the patient had been able to move about more freely, his chest condition had entirely cleared up. The blocks were removed from the top of the bed, and the patient was not propped up so much.

28/10/40. During the past week, there had been very satisfactory progress. The patient was eating and sleeping well, and felt very comfortable.

The rubber dam drain was removed from the wound, the rest of which had almost entirely healed.

1/10/40. The patient was discharged to Convalescent House.
Case 2. Perforated Jejunal Ulcer.

Discussion.

History.

Any discussion of the history of this case must start from the time of the patient's first admission to hospital, in order to gain a true perspective of his condition.

In 1926, a posterior gastro-enterostomy was performed in an attempt to relieve symptoms of peptic ulcer, extending over about 17 years. The advisability of this step can justifiably be called in question, especially in the light of subsequent events. Two points stand out. Firstly, the patient had no symptoms of pyloric stenosis. The absence of pyloric stenosis, in itself, is enough to influence the result of the operation adversely. In the second place, no attempt had been made to treat the ulcer by medical means. Surely, this should be the first line of treatment, and surgery should be reserved for the treatment of intractable cases, and of complications that cannot be treated by conservative measures.

It would appear therefore, that in this case, it would have been much better to have studied the effects of efficient medical treatment, before contemplating operative interference.

At the time of operation, however, it must be remembered that the surgical treatment of peptic
ulcer by means of gastro-enterostomy was much in
vogue. The operation, when first introduced, had
been primarily intended for the relief of pyloric
stenosis, but its use was soon extended to other
conditions. Now, the indications for gastro-enterost-
omy have become narrowed down, and its main use is
in the treatment of that condition, for the
relief of which the operation was first performed.

For 6 years after operation, the patient remained
quite well, and then symptoms once more returned,
to culminate in a haematemesis in 1937. It is inter-
esting to compare those symptoms with the original
complaints.

In 1926, the patient stated that the pains
came on 2-3 hours after food. In 1937, however, the
pains "came on at any time of the day, during
intervals between meals." Also, there were fewer
remissions from symptoms, and much more emphasis
was laid on accompanying nausea, heartburn, retching,
and sickness. Finally, there was the haematemesis.

Thus, although the old symptoms returned,
they were not entirely the same as before. The
recurrence of ulcer symptoms after a gastro-enterost-
omy must at all times lead one to suspect jejunal
ulceration, while irregularity of symptoms, less
frequent remissions, and the occurrence of haematemesis lend strength to such a suspicion.

A test meal showed a high level of gastric
acidity. Hyperchlorhydria is said to be the most
frequent cause of jejunal ulcer (Lewisohn and Feldman), although some deny this assumption (VanZant).

Jejunal ulcer has, however, never occurred in 524 cases of extensive gastrectomy performed by Finsterer.

In this case, X-ray examination in 1937 failed to reveal any ulcer crater either in the duodenum or jejunum. This does not exclude the possibility of ulceration, however, for it has been found that radiography gives a positive result in only two-thirds to three-quarters of cases. On close examination of the x-ray, there is some irregularity of the stoma, and this may indicate a condition of inflammation of the jejunum in that region.

Although bleeding is common from a jejunal ulcer, it more often takes the form of a constant oozing, leading to melena, than of a sudden haematemesis.

Medical treatment resulted in the relief of symptoms for a further three years, and then, after only a few weeks discomfort, perforation occurred.

The ensuing symptoms were entirely different from any the patient had experienced previously. The sudden onset of stabbing pain, the immediate shock, and distress, and later, the onset of vomiting are all typical of peritoneal irritation. Although 5 hours had elapsed since the time of onset, the patient had been in constant pain. There had been no remission of symptoms, no so-called "silent
period", during which the patient feels better, and which is one of the most misleading phases in the course of a peritonitis. A medical man, seeing a patient for the first time during one of these remissions, might well fail to grasp the significance of the previous history, and the gravity of the situation.

Here, one may summarise the characteristic features of jejunal ulceration, as illustrated by this history.

1. It is a condition almost entirely confined to males.

2. It occurs most commonly after gastro-enterostomy undertaken for the cure of a duodenal ulcer.

3. It is most often seen in the presence of a persistent hyperacidity.

4. The symptoms are similar to those of the original ulcer, but possess the slight but significant differences already discussed.

5. Bleeding is a common complication of such ulceration.

6. Perforation is liable to result.

7. The condition is very intractable to treatment.

Examination.

The feature that struck the observer most on examining this patient was the degree of collapse present. There was marked pallor, and the whole body was covered with such a profuse perspiration
that the immediate bed-clothes were damp. It is true that the pallor might have been due to an associated anaemia, and it is unfortunate that no estimation of haemoglobin content of the blood was made. An "ulcer diet" is usually deficient in iron, and this factor, in combination with bleeding from an ulcer, is one of the common causes of anaemia in a man.

The pulse and respiration readings obtained on admission might give rise to some difficulty. With a pulse rate of 80/min, and a respiration rate of 32/min, the pulse:respiration ratio is exactly $\frac{80}{32} : 1$. This, taken by itself, would immediately suggest a thoracic cause for the patient's symptoms. In this particular case, it so happens that there are well marked abdominal signs, but one can easily see how difficult it might be to distinguish between, for example, a diaphragmatic pleurisy and an upper abdominal lesion, when the abdominal signs are minimal.

The findings on examination of the abdomen were all manifestations of a generalised peritonitis, and there were no very definite localising signs. Tenderness and rigidity were widespread, and gave little help in locating the lesion.

**Diminution of liver dullness** was perhaps one of the most important findings. It could be definitely demonstrated in this case. It is seldom that this sign can be elicited, and still more
rarely can it be demonstrated without ambiguity. More often than not, it does not indicate the presence of gas in the peritoneal cavity, but rather, emphysema of the lung, or gaseous distension of an abdominal viscus. In this case, however, there were no signs of any associated emphysema, and the abdomen was flat and retracted. Moreover, the dullness was easily demonstrated in the mid-axillary line.

"If in any acute abdominal case, distinct resonance be obtained over the liver, in the mid-axillary line about two or more inches above the costal border, one is certainly dealing with a perforation of a gastric or duodenal ulcer" (Zachary Cope.)

Shifting dullness was demonstrable in the flanks, and much more readily so after the patient had been anaesthetised and the muscular rigidity overcome. It is odd, that although free fluid was definitely present, and in sufficient quantity to be appreciated by this test, no fullness of the pouch of Douglas could be felt, and no tenderness of the pelvic peritoneum was elicited.

Examination alone could not have enabled one to make an exact diagnosis in this case, for the clinical findings in a perforated duodenal or gastric ulcer would have been identical. Fortunately, from the history, and the presence of an abdominal
scar, one knew that there had been previous operative interference for duodenal ulceration, and fortunately, the notes describing the nature of this operation were found before treatment was undertaken.

The importance of taking an adequate history is thus evident, and it is not sufficient to limit such a history to the immediate events. The whole course of the illness must be traced from the first appearance of symptoms, so that a clear conception of all its phases is obtained. Otherwise, no accurate diagnosis can be obtained, nor can any appreciation of the aetiological factors underlying the condition be gained. Without an accurate diagnosis, and an idea as to the course of the condition, there can be no satisfactory treatment, planned to suit each individual case.

Operative Findings and Treatment.

Much free fluid was found in the peritoneal cavity, as a result of a perforated jejunal ulcer situated on the posterior aspect of the Jejunum, about an inch below the site of anastomosis. It could not thus be strictly termed an "anastomotic ulcer". The exact position of the ulcer was atypical, for such ulcers more often perforate on the anterior, rather than the posterior aspect of the Jejunum. On referring to the case notes of the original gastro-enterostomy, one finds that the
duodenal ulceration was also on the posterior aspect,—which again is unusual. There does not seem to be any possible explanation for this peculiar tendency to "posterior ulceration".

Operative treatment consisted in the removal of the free fluid, closure of the perforation with Lembert sutures, and drainage of the peritoneal cavity.

In view of what has been said about the aetiology of jejunal ulcer, and its association with hyperacidity, the question of gastrectomy might be considered. The general condition of the patient, at the time of operation, was such that extensive or prolonged operative measures could not be safely undertaken. Later, if symptoms continue, or return, and are not relieved by adequate medical measures, this course may have to be more seriously considered. Since his discharge from hospital, however, the patient has reported that he is keeping well.

It will be noted that the peritoneal cavity was drained by a large tube drain. At the present time, there is a tendency to close the wound completely, and leave Nature to deal with an residual peritoneal inflammation. While one is all in favour of the adoption of conservative measures, and there is no doubt that this course is attended by excellent results, in some cases, this is by no means true in every case. It would appear, that on
the whole, patients in whom the peritoneal cavity has been drained make a more rapid and uneventful recovery, than those in whom no external drainage has been established.
Case 3.

Name of Patient: Thomas Renwick. Aet. 74.
Admitted to Wd. 18: 1/11/40.

Complaint: Severe constipation and abdominal distension.

Diagnosis: Carcinoma of pelvic colon.

Treatment: Colostomy.

Result: Relieved.
Case 3. Carcinoma of Pelvic Colon.

Patient's Name: Thomas Renwick. Aet. 74.

Dryhope,
Yarrow,
Selkirk.

Recommended by: Dr. Macaulay,
Selkirk.

Admitted to Ward 18: November 1st. 1940

Complaint: Severe constipation and abdominal distension. Duration of acute symptoms: 1 week.

Occupation: Shepherd.

History of Present Condition.

For the past twelve years, the patient has suffered from constipation. Until September 1939, he was always able to open the bowels with the aid of purgatives, but, at this time, the constipation became acute. He was then admitted to a local nursing home, where his symptoms were relieved by medical means.

At the beginning of October 1940, he had another attack of acute constipation, which gradually became worse, so that for a week before admission, he was unable to obtain any movement of the bowel. At the same time, the abdomen became increasingly distended. The patient gained some relief in the evenings from repeated flatus enemata. Just prior to the acute attack of constipation, the patient noticed the
presence of some blood in the motions.

As the patient's symptoms increased, he lost his appetite, and there was a continual feeling of nausea.

Since October 27th, 1940, five days before admission, there has been vomiting, the vomited matter being yellow in colour. The patient was unable to retain any solid food, and his diet was composed entirely of fluids. In spite of this increased fluid intake, there has been great thirst.

With the onset of the acute symptoms, pain developed in the abdomen, increasing in severity in proportion to the amount of distension, and being situated mainly in the region of the umbilicus.

For the past five days, the patient has eructated a little wind, and has passed a little flatus by the bowel.

Previous Illnesses.

The patient has had no previous illnesses, and has always led an active outdoor life. In the last few months, he has noticed some loss of weight, and has not felt as able for his work as formerly. In all, he has lost between 1-2 stones in weight.

Family History.

The patient comes from a "long lived" family. Both his parents died when over eighty years of age.
Habits.

For the greater part of the year, the patient is accustomed to walk long distances each day. When the sheep are sheared, he has to sit at his work, every day for about a week. At such times, the patient found that his constipation was much more severe.

The patient eats plain wholesome food, with an abundance of roughage. He smokes very strong tobacco, and only rarely takes alcohol.

Examination on Admission. 1/11/40.

T.P.R. 98 degs.F. 112/min. 24/min.

General Appearance.

The patient is a weather-beaten man, who, in appearance, does not look older than 60 years. His colour is good, and the general condition is very satisfactory, considering the history and the amount of abdominal distension.

Alimentary System.

The tongue was clean and moderately moist. There was no noticeable foulness of the breath. The teeth were artificial and in good working order.

On inspection of the abdomen, marked generalised distension was evident. The skin was tense and the umbilicus flush with the surface. By measurement, the girth around the umbilicus was found to be 39 ins. There was no appreciable movement of
the abdomen on respiration.

There were no protrusions through any of the hernial orifices.

Palpation of the abdomen was difficult on account of the great tension. In the left iliac fossa, just above the lateral part of the inguinal ligament, it was thought that there was a palpable mass.

No enlargement of the liver or spleen could be felt.

On pressure over the lower abdomen, the patient suffered some pain and discomfort, mainly in the midline, below the umbilicus.

No tenderness or rigidity could be demonstrated. No peristaltic movements could be felt.

On percussion, the abdomen was hyper-resonant, with some dullness in the flanks, which shifted when the patient was turned over on his side. There was slight diminution in the liver dullness.

No areas of hyperaesthesia were detected.

Rectal Examination: High up in the rectum, a hard mass could be detected with difficulty. Its exact nature and extent could not be defined. Its situation appeared to be in the region of the pelvi-rectal junction.

Respiratory System.

The chest was poorly developed, being narrowed in the lower half. The respiratory expansion was poor.

On percussion, no areas of dullness could be elicited. On auscultation, the presence of some rhonchi was
Photograph showing degree of abdominal distension.
revealed.

Central Nervous System.

Both pupils reacted normally to light and accommodation.

Knee and ankle jerks were present and active.

Cardio-Vascular System.

The pulse rate was increased, (112/min.), and the pulse was of poor volume. It was regular in time and force. The vessel wall was thickened and easily palpable.

The heart was not enlarged, and the valve sounds were closed in all areas.

Urinary System.

No abnormality was detected. Examination of the urine revealed no abnormal constituents.

From the above history and examination, the patient's condition was considered to be due to obstruction of the large bowel, probably as a result of malignant disease.

Summary of the main points in the history and examination.

1. History of constipation, with an acute attack one year ago, (1939).

2. Absolute constipation for 7 days, with increasing abdominal distension.

3. Vomiting for 5 days.

4. Some pain and discomfort in the region of the umbilicus.
5. Some shifting dullness demonstrated in the flanks.
6. Indefinite mass palpable in the left iliac fossa.
7. Mass felt high up in the rectum.

Operation. 1/11/40. 4.30 p.m.

Premedication: Omnopon grs.1/3, atropine grs.1/100
Anaesthetic: Nitrous oxide, oxygen, and ether.
Surgeon: Mr. Tulloch.
Operation: Colostomy.

The abdomen was opened by means of a left grid-iron incision. The peritoneum was seen to bulge out into the wound, and its vessels were prominent. As soon as the peritoneal cavity was opened, a quantity of clear fluid escaped. A loop of bowel was brought out through the wound, and identified as
descending colon. The upper part of the pelvic colon could not be liberated, on account of the strain on the pelvic meso-colon. Therefore, the lowest loop of descending colon was drawn out, and the peritoneum sutured to its walls. The bowel was further secured by means of two pairs of Allis's tissue forceps attached to it, and left protruding from the wound. An opening into the bowel was then made, and a Paul's tube inserted, and secured by means of a purse string suture. The tube immediately filled with semi-fluid faecal matter.

The skin around the bowel was finally brought together with loose s.w.g. sutures.

During the operation, the patient's condition gave rise to some anxiety. During induction with the anaesthetic, there had been some vomiting, and throughout, the anaesthetic had been tolerated badly. Towards the end, the pulse had become more rapid, and weaker.

Post-operative Treatment and Convalescence.

1/11/40. Operation at 4.30 p.m.

The patient was returned to a warm bed, and additional warmth applied by means of hot water bottles and an electric shock cage. The colostomy tube was arranged to drain into a large bottle at the side of the bed. Fluid faecal matter drained away in a steady stream. 1 c.c. of Coramine was given by hypodermic injection at 6 p.m.
At 6.55 p.m., Omnopen grs. 1/6 was given, and at 10 p.m., 4 c.c. of Digilanid were injected intravenously.

2/11/40. The patient had passed a fairly comfortable night, and his general condition was much improved. In the early morning, the colostomy tube had come out, but not before about 80 ozs. of faecal matter had drained away. Drainage continued to occur from the wound. The abdominal distension was much less marked, and the patient felt much relieved. He was able to drink a considerable amount of fluid throughout the day.

3/11/40. The general condition was again much improved. The patient had had a good night's rest. Much faecal matter was still draining from the colostomy opening. The tissue forceps were removed from the wound. The patient was able to take a light diet, consisting mainly of fluids, and milk puddings, custards, and scups.

A slight cough developed, but this occasioned the patient not discomfort. There were some rhonchi and crepitations to be heard at both lung bases. An expectorant cough mixture was prescribed.

4/11/40. Progress was still maintained. The colostomy was now acting in a regular manner, there being between two to four motions per day. The diet was being steadily built up, more and more solids being added.

There was still some cough and some sputum, but the signs in the chest had not increased or changed
their character.

5/11/40. The patient's general condition was still further improved. The abdominal distension was now absent, and the abdominal was quite lax. On palpation, in the left iliac fossa, a hard fixed mass could be definitely felt.

The cough was now showing signs of diminishing, and the signs in the chest were much less marked.

12/11/40. Progress had been uneventful throughout the past week. In preparation for a barium enema, the bowel below the colostomy had been washed out, with a small faecal result.

Today, the stitches were removed. The colostomy opening was continuing to function satisfactorily.

13/11/40. A barium enema was given and an x-ray examination made. The report was as follows:

"Barium enema showed an obstruction of the pelvic colon. Filling of the lower large bowel via the colostomy demonstrated the obstruction to be comparatively complete. It is in all probability due to carcinoma."

18/11/40. A sigmoidoscopic examination was undertaken. At a distance of 15cms. from the anal opening, the bowel was seen to be completely obstructed by a tumour. The growth was fixed, and considered to be inoperable.

19/11/40. The patient was allowed up for the first time since his admission.

22/11/40. The patient was discharged home with a colostomy belt. He was in excellent general health.
Subsequent History.

5/3/41. The patient returned as an out-patient. He was in good spirits, and his general health was much improved. He complained, however, that the colostomy opening required constant care to prevent closure. He was therefore re-admitted for treatment.

On examination, the colostomy wound was now seen to be retracted. The patient stated that it was closing up every week. The carcinoma was very large and fixed and inoperable. Slight fluid was being passed per rectum.

6/3/41. Operation:

Under ethyl chloride and ether anaesthesia, Mr. Jardine excised the edges of the wound, and stretched and enlarged the opening. No stitches were inserted.

13/3/41. The colostomy was enlarged again with rectal bougies, no anaesthetic being used.

16/3/41. The patient was discharged home. His general condition was good. His wife was given instructions to stretch the colostomy opening periodically.

12/12/41. It was learned from the Follow Up Department of the R.I.E. that the patient had died, the cause of death being extension of the disease.
Case 3. Carcinoma of Pelvic Colon.

Discussion.

History.

The history of this case may be divided into two parts:—

1. Chronic phases.

The patient had had continual difficulty with the bowels for 12 years, and this culminated in acute constipation necessitating treatment in a nursing home in September 1939. Thereafter, until October 1940, there followed another chronic phase, again ending in acute constipation.

2. Acute phases.

The first of these was in 1939, and the second in 1940. The first was amenable to medical treatment, while the second required surgical intervention.

Prior to 1928, the patient had no great difficulty with his bowels, and it was only since then that he had required to take laxatives more or less constantly. In a man of 62 years, such a change in the bowel habit should always suggest the possibility of carcinoma of the colon. It is inconceivable, however, that this patient's symptoms could have been due to such a cause from the very beginning. On the other hand, it is extremely likely that neoplastic changes had developed prior to the first
occurrence of acute symptoms, and that these were in fact due to a carcinomatous obstruction of the pelvic colon. An annular type of cancer in the colon is extremely slow growing, and metastasis occurs late on in the disease.

It is not possible to determine in this case the exact time of onset of the condition. There does not seem to have been any change in the symptomatology which might have acted as a guide. Thus, it cannot be said that the tumour growth produced any change in the bowel habit,—a sign of great clinical significance in many cases. The patient sought advice, only when constipation was unrelieved by purgatives, and this formed his only complaint.

In spite of the previous history, however, one cannot but feel that a grave mistake was made in failing to investigate the patient after the obstruction had been relieved. Treatment had followed purely symptomatic lines, and no attempt was made to discover the cause. An annular type of carcinoma, to become palpable in a distended abdomen, and to cause complete obstruction, must have been present for some considerable time, and it is very likely that sigmoidoscopic and radiographic investigation would have shown its presence a year ago. This belief is supported by the fact that in an exhaustive analysis of cases in the Johns Hopkins Clinic, Miller showed that a history of chronic obstruction extending over the best part of a year
was obtained in about 40% of patients. Another 20% were admitted in acute obstruction, or had previously survived such an attack.

Immediately prior to his admission to the R.I.E., the patient’s symptoms altered. Whereas, previously, he had complained only of constipation, there were now the following additional manifestations:

1. Abdominal distension.
2. Pain
3. Vomiting
4. Passage of blood in the stools.

To these may be added loss of weight, which had extended over the past few months.

We thus have present the 3 cardinal symptoms of acute intestinal obstruction,—pain, vomiting, and constipation.

Constipation. Of this, little more need be said, save to remark on its completeness. To such constipation, the term coprostasis is applied.

Pain. This was at no time a major symptom, and was more in the nature of a vague discomfort. In part, it was associated with the increasing abdominal distension. Pain of this nature is relatively common in carcinoma affecting the distal part of the colon, and it is only comparatively rarely that localised discomfort or pain is found.

Vomiting. As in other types of intestinal obstruction, the vomiting was preceded by nausea, and was progressive and persistent in character.
The passage of blood in the stools is also another feature seen in carcinoma of the large intestine. Usually, the blood is so intimately mixed with the faeces that it cannot be distinguished by the naked eye, and it is only when a considerable amount is present that it becomes obvious to the patient.

The loss of 1-2 stones in weight over a few months, occurring in a middle aged person, is always suggestive of carcinoma. It is, however, usually a comparatively late manifestation in subjects suffering from cancer of the colon. Its occurrence in this case would seem to be further evidence of the prolonged nature of the patient's condition.

The history of this case thus illustrates some of the features of intestinal obstruction, but perhaps more important than this, it emphasises the of a thorough examination in every case of constipation in a middle aged person, no matter how prolonged the previous history may be.

Examination.

Examination of the patient revealed the following:

1. Great abdominal distension.
2. Some shifting dullness in the flanks.
3. A vaguely palpable mass in the left iliac fossa, also felt with difficulty on rectal examination.

Distension. The extent of the abdominal enlargement
can be appreciated in the photograph included with the case record. It will be seen that the distension is well marked and generalised. It was not accompanied by any visible peristalsis. Abdominal distension to such a degree is almost always due to large bowel obstruction, and is a late manifestation - as indeed it is in this case, for from the history, there had been imperfect bowel movement for some time, and no faeces had been passed for at least a week.

"Distension, vomiting, pain, and constipation, occurring in an elderly person, without any evidence of peritonitis, are generally due, either to cancer of the large bowel, volvulus, diverticulitis, or very rarely to intussusception or uraemia." (Cope).

In this case, the history of onset, the rectal examination and negative urinary findings exclude fairly conclusively all but cancer and its great imitator, diverticulitis. While no histological proof was obtained, the subsequent sigmoidoscopy was in favour of the former cause, and this opinion was confirmed by the radiological findings, and the ultimate course of the disease.

**Shifting dullness.** This sign might have been due to one of several causes in this patient:-

1. Increase in the amount of peritoneal fluid as a result of the obstruction. Such an increase is commonly seen, but rarely is it great enough to be detectable by clinical means.

2. The presence of much fluid material in a dilated
atonic gut. Such a state of affairs may be misleading. The dullness is due to fluid, and is shifting, the fluid being not in the peritoneal cavity, but in the gut itself.

3. Malignant ascites, or ascites due to carcinomatous involvement of the liver. Although there was no clinical enlargement of the liver, this possibility could not altogether be excluded.

On opening the abdomen, free fluid escaped. There was no recurrence of ascites after operation, so that the obstruction must have been the true cause.

Palpable mass. The palpation of a mass in the left iliac fossa was a most important feature. It was a localising sign, and it was also of great diagnostic significance, for it was very suggestive of carcinoma being the possible cause.

The mass was felt rectally as well. A rectal examination is one which often yields valuable results and yet it is too often omitted. It is safe to say that in all abdominal conditions, as well as in malignant disease of the breast, a rectal examination should be performed.

Operative Findings and Treatment.

Pre-operative treatment.

In this case, apart from the administration of Omnopon and atropine, nothing was done in the way of pre-operative treatment. For this, there can be
no excuse. The prolonged vomiting, and marked abdominal distension were obvious indications for gastric aspiration. A stomach tube should have been passed prior to operation, and the stomach emptied of its contents. Even if this had meant postponement of the operation for an hour or so, the advantages would have fully justified the delay. Combined with this measure, fluid should have been administered intravenously, for 3 reasons:

1. Dehydration was already present as a result of the vomiting.
2. Gastric aspiration removes more fluid, which loss must correspondingly be made up.
3. The release of the obstruction is accompanied by circulatory upset, which can be minimised by the administration of fluid.

The gastric aspiration and intravenous therapy should have been continued throughout the operation, and for some time afterwards, perhaps another 24 hours for the former, and 2-3 days for the latter.

The employment of such measures may make all the difference between a successful and a fatal issue to the case: failure to employ them jeopardises the patient's chances of recovery, puts an unfair burden on the anaesthetist, in an already trying case, and makes the surgeon's task all the more difficult. Thus, we find, that during the operation, "the patient's condition gave rise to some anxiety. During induction with the anaesthetic, there had been some vomiting, and throughout, the anaesthetic
Case 3. Carcinoma of Pelvic Colon.

Discussion.

History.

The history of this case may be divided into two parts:-

1. Chronic phases.

The patient had had continual difficulty with the bowels for 12 years, and this culminated in acute constipation necessitating treatment in a nursing home in September 1939. Thereafter, until October 1940, there followed another chronic phase, again ending in acute constipation.

2. Acute phases.

The first of these was in 1939, and the second in 1940. The first was amenable to medical treatment, while the second required surgical intervention.

Prior to 1928, the patient had no great difficulty with his bowels, and it was only since then that he had required to take laxatives more or less constantly. In a man of 62 years, such a change in the bowel habit should always suggest the possibility of carcinoma of the colon. It is inconceivable, however, that this patient's symptoms could have been due to such a cause from the very beginning. On the other hand, it is extremely likely that neoplastic changes had developed prior to the first
occurrence of acute symptoms, and that these were in fact due to a carcinomatous obstruction of the pelvic colon. An annular type of cancer in the colon is extremely slow growing, and metastasis occurs late on in the disease.

It is not possible to determine in this case the exact time of onset of the condition. There does not seem to have been any change in the symptomatology which might have acted as a guide. Thus, it cannot be said that the tumour growth produced any change in the bowel habit,—a sign of great clinical significance in many cases. The patient sought advice, only when constipation was unrelieved by purgatives, and this formed his only complaint.

In spite of the previous history, however, one cannot but feel that a grave mistake was made in failing to investigate the patient after the obstruction had been relieved. Treatment had followed purely symptomatic lines, and no attempt was made to discover the cause. An annular type of carcinoma, to become palpable in a distended abdomen, and to cause complete obstruction, must have been present for some considerable time, and it is very likely that sigmoidoscopic and radiographic investigation would have shown its presence a year ago. This belief is supported by the fact that in an exhaustive analysis of cases in the Johns Hopkins Clinic, Miller showed that a history of chronic obstruction extending over the best part of a year
was obtained in about 40% of patients. Another 20% were admitted in acute obstruction, or had previously survived such an attack.

Immediately prior to his admission to the R.I.E., the patient's symptoms altered. Whereas, previously, he had complained only of constipation, there were now the following additional manifestations:

1. Abdominal distension.
2. Pain
3. Vomiting
4. Passage of blood in the stools.

To these may be added loss of weight, which had extended over the past few months.

We thus have present the 3 cardinal symptoms of acute intestinal obstruction,—pain, vomiting, and constipation.

**Constipation.** Of this, little more need be said, save to remark on its completeness. To such constipation, the term coprostasis is applied.

**Pain.** This was at no time a major symptom, and was more in the nature of a vague discomfort. In part, it was associated with the increasing abdominal distension. Pain of this nature is relatively common in carcinoma affecting the distal part of the colon, and it is only comparatively rarely that localised discomfort or pain is found.

**Vomiting.** As in other types of intestinal obstruction, the vomiting was preceded by nausea, and was progressive and persistent in character.
The passage of blood in the stools is also another feature seen in carcinoma of the large intestine. Usually, the blood is so intimately mixed with the faeces that it cannot be distinguished by the naked eye, and it is only when a considerable amount is present that it becomes obvious to the patient.

The loss of 1-2 stones in weight over a few months, occurring in a middle aged person, is always suggestive of carcinoma. It is, however, usually a comparatively late manifestation in subjects suffering from cancer of the colon. Its occurrence in this case would seem to be further evidence of the prolonged nature of the patient's condition.

The history of this case thus illustrates some of the features of intestinal obstruction, but perhaps more important than this, it emphasises the of a thorough examination in every case of constipation in a middle aged person, no matter how prolonged the previous history may be.

Examination.

Examination of the patient revealed the following:-
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2. Some shifting dullness in the flanks.
3. A vaguely palpable mass in the left iliac fossa, also felt with difficulty on rectal examination.

Distension. The extent of the abdominal enlargement
can be appreciated in the photograph included with the case record. It will be seen that the distension is well marked and generalised. It was not accompanied by any visible peristalsis. Abdominal distension to such a degree is almost always due to large bowel obstruction, and is a late manifestation - as indeed it is in this case, for from the history, there had been imperfect bowel movement for some time, and no faeces had been passed for at least a week.

"Distension, vomiting, pain, and constipation, occurring in an elderly person, without any evidence of peritonitis, are generally due, either to cancer of the large bowel, volvulus, diverticulitis, or very rarely to intussusception or uraemia." (Cope).

In this case, the history of onset, the rectal examination and negative urinary findings exclude fairly conclusively all but cancer and its great imitator, diverticulitis. While no histological proof was obtained, the subsequent sigmoidoscopy was in favour of the former cause, and this opinion was confirmed by the radiological findings, and the ultimate course of the disease.

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1. Increase in the amount of peritoneal fluid as a result of the obstruction. Such an increase is commonly seen, but rarely is it great enough to be detectable by clinical means.
2. The presence of much fluid material in a dilated
atonic gut. Such a state of affairs may be misleading. The dullness is due to fluid, and is shifting, the fluid being not in the peritoneal cavity, but in the gut itself.

3. Malignant ascites, or ascites due to carcinomatous involvement of the liver. Although there was no clinical enlargement of the liver, this possibility could not altogether be excluded.

On opening the abdomen, free fluid escaped. There was no recurrence of ascites after operation, so that the obstruction must have been the true cause.

**Palpable mass.** The palpation of a mass in the left iliac fossa was a most important feature. It was a localising sign, and it was also of great diagnostic significance, for it was very suggestive of carcinoma being the possible cause.

The mass was felt rectally as well. A rectal examination is one which often yields valuable results and yet it is too often omitted. It is safe to say that in all abdominal conditions, as well as in malignant disease of the breast, a rectal examination should be performed.

**Operative Findings and Treatment.**

**Pre-operative treatment.**

In this case, apart from the administration of Omnopon and atropine, nothing was done in the way of pre-operative treatment. For this, there can be
no excuse. The prolonged vomiting, and marked abdominal distension were obvious indications for gastric aspiration. A stomach tube should have been passed prior to operation, and the stomach emptied of its contents. Even if this had meant postponement of the operation for an hour or so, the advantages would have fully justified the delay. Combined with this measure, fluid should have been administered intravenously, for 3 reasons:

1. Dehydration was already present as a result of the vomiting.
2. Gastric aspiration removes more fluid, which loss must correspondingly be made up.
3. The release of the obstruction is accompanied by circulatory upset, which can be minimised by the administration of fluid.

The gastric aspiration and intravenous therapy should have been continued throughout the operation, and for some time afterwards, perhaps another 24 hours for the former, and 2-3 days for the latter.

The employment of such measures may make all the difference between a successful and a fatal issue to the case: failure to employ them jeopardises the patient's chances of recovery, puts an unfair burden on the anaesthetist, in an already trying case, and makes the surgeon's task all the more difficult. Thus, we find, that during the operation, "the patient's condition gave rise to some anxiety. During induction with the anaesthetic, there had been some vomiting. and throughout, the anaesthetic
had been tolerated badly. Towards the end, the pulse had become more rapid, and weaker."

In the writer's opinion, the fact that the patient made a good recovery, was more due to the inherent stamina of a country dweller, than to the treatment of his general condition.

**Anaesthetic:**

It is doubtful whether a general anaesthetic should have been used— even if efficient gastric aspiration had previously been carried out. In cases such as this, spinal anaesthesia is eminently suitable. There is not the same danger from vomiting, and good relaxation is obtained. The occurrence of post-operative complications, which are especially common in an elderly patient, is reduced. Although such anaesthetics tend to lower the blood pressure, this disadvantage is far outweighed by the advantages.

**Operative Treatment.**

A left inguinal colostomy was performed, and a Paul's tube inserted to relieve the obstruction. Drainage was satisfactory, and the end-result was reasonably good.

There has been much discussion as to the respective merits of colostomy and "blind caecostomy". On account of the great distension of the gut, and the fixity of the tumour, it was not possible in this case to perform a Mikulicz exclusion type of operation. The performance of a caecostomy would have been no more easy than the operation chosen, for the caecum would have been
grossly distended, and its wall probably already ulcerated. In addition, there would be the danger of its rupture during the operation, and also, there would have been the necessity of a second operation at a later date. Finally, were a caecostomy performed, drainage would not have been so satisfactory, and no hint as to the exact site of the obstruction could have been gained, for the distension of the gut would have made it impossible to carry out any exploration of the abdomen.

Post-operative Progress.

Progress after the first 24 hours was uneventful and rapid. As has been discussed above, the continuation of gastric aspiration and intravenous saline would have been beneficial in the immediate post-operative period, much more so than the injection of Coramine or Digilanid.

Although inoperable carcinoma must always fill one with anxiety, it is gratifying to note that this patient lived for over a year in comparative comfort, and in good general health. When he returned as an outpatient, one could not fail to be impressed by his obvious well-being, and good spirits.

To summarise, the following features of carcinomatous obstruction are illustrated:

1. Age of patient—over 40 years of age.
2. Sex of patient—commoner in the male.
3. Site—usually in the colon, and most commonly
in the pelvic colon,- 40 % of all cases.

4. Symptoms- the first and most important is constipation.

5. Passage of blood in the stools is an important sign.

6. There is a tendency for acute obstruction to develop. The reason for this is that in the pelvic colon, in contrast with the rest of the colon, the lumen of the bowel is smaller, and the bowel contents are of a more solid nature. Obstruction is therefore a much more common complication of carcinoma in the pelvic colon than elsewhere.

7. The development of obstruction, with the following symptoms:-

   a. Pain.
   b. Nausea and vomiting.
   c. Constipation.
   d. Abdominal distension occurring as a late manifestation, and capable of reaching a gross degree.

8. Relative absence of systemic signs of carcinoma, e.g. little wasting, etc.

9. Slowness of spread of the disease to other parts.
Case 4.

Name of Patient: - Joan Tristan. Aet.18.
Admitted to Wd. 17: - 1/11/40.
Complaint: - Right sided abdominal pain.
Diagnosis: - Obstruction due to ovarian cyst.
Treatment: - Ovariotomy.
Result: - Recovery.
Case 4.  Intestinal Obstruction.

Patient's Name: Joan Tristan, Aet. 18.

c/o Rae,
49 Windsor Place,
Portobello.

Recommended by: Dr. Wright,
Brighton Place,
Portobello.

Admitted to Ward 17: November 1st, 1940.

Complaint: Right sided abdominal pain.

Duration: 7 days.

Occupation: Chemist's apprentice.

History of Present Condition.

On October 25th., seven days before admission to hospital, the patient had an attack of pain in the right side of the lower abdomen. The pain kept her awake that night, and was severe again the following day. The acute pain passed off in the evening, and since then felt like an ache, coming and going in spasms.

On Thursday, (31/10/40), the day before admission, the patient had another attack of severe pain, of greater intensity than before, but in much the same position. The patient was at her work at the time, but the severity of the pain was such, that she felt too ill to carry on, and had to go home to bed. In the evening, she took some alcohol, in an attempt to relieve the pain, but it
only made her sick. She vomited a considerable amount of yellowish fluid, with an offensive odour.

The patient passed a restless night, and was still suffering pain the next morning.

Since the onset of the severe symptoms, the patient was unable to take any solid food. There was continual thirst, and she drank copious amounts of fluids.

During the last few months, the bowels had been very constipated, and since the onset of the pain, had not moved.

**Previous Illnesses.**

At the age of 8 yrs. the patient had an attack of pneumonia.

Several years ago, the patient had a similar attack of pain, which passed off in two to three days. At the time, it was thought to be due to appendicitis.

The last menstrual period started on 22/10/40 and lasted two days. The patient states that she menstruates every other month. The periods are quite regular, and are not excessive. They are accompanied by slight pain.

**Habits.**

The patient works as a chemist's apprentice. The work is not unduly strenuous, and the hours of work are not too long.

She does not smoke, and is not in the habit of taking alcohol.
Examination on Admission. 1/11/40.

T.P.B. 99.4 degs.F. 92/min. 20/min.

General Appearance.

The patient was a young, lightly built girl. She did not look very ill, and at the time of examination, was not suffering much pain. The face was slightly flushed, and she was rather apathetic.

Alimentary System.

The tongue was heavily furred, and the breath foul. The teeth were fairly good, but several showed signs of decay.

On inspection of the abdomen, it was seen to move quite well with respiration, although there was some slight limitation in the region of the right iliac fossa. There was no obvious distension of the abdomen, no abnormal swellings were to be seen, and there were no protrusions through any of the hernial orifices.

On palpation, some muscle guarding was appreciable in the region of the right iliac fossa. On palpating more deeply in the same region, a mass was to be felt. In size, it was as large as an orange, and it was fairly soft in consistency. Pressure over it caused acute pain. Slight discomfort was caused on pressure in the left iliac fossa, pain being felt both locally, and also referred to the right iliac fossa.

On percussion, there was an area of dullness corresponding in position to the mass palpated.
A slight degree of hyperaesthesia was present in the right iliac fossa.

Obturator and psoas tests were negative.

As far as could be ascertained, there was no enlargement of any of the abdominal organs.

Rectal Examination: Slight pain was elicited with pressure on the right side. There was no fullness of the pouch of Douglas, and no abnormality in any of the female pelvic organs could be detected.

Respiratory System.

The chest was well formed and well developed. Respiratory expansion was good, and was not impaired by the abdominal condition. Percussion revealed no areas of dullness, and no abnormalities were detected on auscultation.

Central Nervous System.

Both pupils reacted equally to light and accommodation.

Knee and ankle jerks were present and active. Cardio-vascular System.

The pulse rate was increased, (82/min), but the pulse was of good volume, and regular in time and force. The vessel wall was not palpable.

The heart was not enlarged, and the valve sounds were closed in all areas. Urinary System.

No abnormality was detected. Examination of the urine failed to reveal any abnormal constituents.
From the above history, past history, and examination, a diagnosis of appendix abscess was made.

After admission, the patient began to develop severe pain in the lumbo-sacral region. This was associated with renewed attacks of vomiting. The vomited matter was greenish-yellow in colour, and foul smelling.

On re-examination, three hours later, the swelling previously felt in the right iliac fossa seemed to extend further up the abdomen to within three inches of the right subcostal margin. There was also increased tenderness in the right iliac fossa.

It was considered advisable to perform a laparotomy.

Summary of the main points in the history and examination.
1. Attack of right sided abdominal pain 7 days ago, at first severe, but later more in the nature of a chronic ache.
2. Recurrence of severe symptoms associated with vomiting within the last 24 hours.
4. Past history of similar attack, several years ago.
5. Tenderness and muscle guarding in the right iliac fossa.
6. Mass palpable in the right iliac fossa, but later extending further up into the abdomen.
7. Increase in size of mass associated with a renewed attack of vomiting.
8. No other abnormality to be detected.

Operation. 1/11/40. 10.30 p.m.

Premedication: Omnopen grs. 1/3, atropine grs. 1/100
Anaesthetic: Nitrous oxygen, oxygen, and ether.
Surgeon: Mr. Tulloch.
Operation: Laparotomy.

A right grid iron incision was made, with its centre over McBurney's point. The abdominal muscles and aponeuroses were separated, and the peritoneal cavity opened into. No free fluid escaped. On inserting a finger into the abdomen, a cystic swelling could be felt, half way up the abdomen, on the right side. From it, a wide fibrous band could be palpated, descending into the pelvis. When the
examining finger was withdrawn, distended bowel appeared in the wound. This was found to be transverse colon, which had become balloononed as a result of a low intestinal obstruction caused by the fibrous band already felt.

A considerable amount of clear yellow fluid now began to fill the wound, and flow away from it. The fluid was removed with swabs and suction.

The incision was now enlarged, and the swelling brought to the surface. It was found to be ruptured, and soft and red. Attached to it was a much larger and softer cystic swelling, palpable high up in the abdomen, just below the costal margin, and adjacent to the liver, on its under surface.

The first swelling was then diagnosed as an enlarged ovary, and the second as a cystic tumour of the ovary.

The cystic tumour was then punctured with a small trocar and cannula, and four or five ounces of a clear yellowish fluid allowed to escape. This procedure allowed the punctured swelling and the diseased ovary to be brought to the surface, thus relieving the obstruction.

After careful ligation of the fibrous band, the ovary and attached tumour were removed, and the remaining part of the band was then covered with peritoneum.

Since the wound was that normally made for an appendicectomy, the appendix was isolated from an ileo-caecal position, ligated, and removed.
No tuberculous glands were seen in the mesentery.
A tube drain was inserted in the pouch of Douglas, and the wound closed in layers with catgut. The skin edges were approximated with s.w.g. and scotia.

The patient's condition after operation was fairly good, there being some degree of surgical shock.

The patient was not a very easy subject to anaesthetise, since the vomiting which had developed a few hours previously persisted throughout the major part of the operation. Vomited material had on several occasions to be removed from the mouth and throat with swabs and suction.

Post-operative Treatment and Convalescence.

1/11/40. Operation at 10.30 p.m.

On the patient's return from the theatre, she was placed in a warm bed, and propped up in Fowler's position. Heat was applied by means of hot water bottles and a large electrically heated shock cage.

The patient passed a disturbed night, still being troubled with vomiting.

2/11/40. The patient's condition was somewhat improved, although she was still a little collapsed.

Rectal saline and glucose was administered for the next 24 hours. There was great thirst, and copious drinks of water and fruit drinks were given. There was still some occasional sickness and vomiting.

3/11/40. The patient was still able only to take fluids. Her temperature was raised, and she was slight-
ly feverish. There was some watery discharge from the wound. Sulphapyridine was prescribed, 2 tablets of 0.5 gm. each being given t.i.d.

4/11/40. The patient was feeling better, and was able to take fluid and semi-solids, such as porridge and milk puddings. In spite of the return of her appetite, she still felt sick at times, and occasionally brought up a little foul yellow material.

5/11/40. The patient still felt very weak and listless. Her temperature was down to within normal limits, and she no longer felt feverish.

The sulphapyridine tablets were discontinued.

7/11/40. The general condition was much about the same, there still being great weakness and exhaustion. The vomiting, however, had stopped, and there was no further discharge from the wound. The abdomen was much less distended, and in the evening, there was a bowel movement, with a small faecal result.

8/11/40. The patient felt much better. For the first time since operation, she had slept well without the aid of morphia. Her appetite had returned, and she was able to take a more solid and more varied diet.

The abdominal drain was removed. The wound was seen to be healing rapidly, and without any signs of inflammation.

12/11/40. Good progress had been made. The patient was feeling well, and was taking an interest in her food and her surroundings.

The skin stitches were removed from the wound.
19/11/40. Progress had been uneventful throughout the past week. The bowels were moving regularly, and the patient was rapidly regaining strength.

Today, for the first time, she was allowed up, for about a quarter of an hour.

22/11/40. Having continued to make an uninterrupted recovery, the patient was discharged home.

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Report by the Pathologist.

Name of Patient: Joan Tristan, aet.18. Wd. 17
Nature of Specimen: Ovarian cyst.

Macroscopic.
Specimen consists of an ovary which is swollen, soft and oedematous, and from one side of which a cyst projects, the cyst being about six centimetres in diameter. The cyst is unilocular, contains clear, serous yellow fluid, and has a lining partly smooth and partly studded with warty papillary growths.

Microscopic.
The solid part of the ovary shows oedema and congestion, and contains several small cysts, lined by double-layered cubical epithelium, and full of eosinophil material. The large cyst is lined by a single layer of cubical epithelium, flattened in places, and shows warty papillae of proliferated ovarian stroma covered with similar epithelium. The
Histological Section.

L.P. photomicrograph showing papilla of proliferated stroma covered with cubical epithelium.
epithelium does not suggest active tumour growth. The picture is that of a simple follicular cystic ovary.
Name of Patient: James Galloway. Aet. 14.
Admitted to Wd. 18: 22/11/40.
Complaint: Right sided abdominal pain.
Diagnosis: Intestinal obstruction.
Treatment: Ileo-transverse colostomy.
Result: Recovery.
Case 5. **Intestinal Obstruction.**

**Patient's Name:** James Galloway, Aet. 14.
33 Thorntree Crescent, Prestonpans.

**Recommended by:** Dr. Black,
" Narathan",
Port Seton.

**Admitted to Ward 18:** November 22nd, 1940.

**Complaint:** Severe pain in the right iliac fossa.
Duration, - 2 days.

**Occupation:** Butcher's assistant.

**History of Present Condition.**

For the past year, the patient has suffered from recurrent attacks of pain in the abdomen. The position of the pain varied from the epigastrium down to the region of the right iliac fossa. It was of a colicky nature, and was not related to the taking of food. The attacks were not accompanied by vomiting, and there were no urinary symptoms. At such times, the bowels continued to move regularly.

On Wednesday, (20/11/40), two days before admission, there commenced a severe attack of pain, similar in type to that experienced previously, but of a more severe nature. It was situated in the right side of the lower abdomen. Soon after its onset, the patient began to feel sick, and later, actual vomiting developed. In the last two days,
vomiting has occurred five times. At first, the vomited material was yellowish in colour, but later, became of a greener hue.

The patient was unable to obtain relief from the pain, and he was awakened at night when each colicky spasm occurred.

Loss of appetite was also complained off, although, there was marked thirst, and the patient drank large quantities of fluids.

The bowels have always been regular, and moved on the day before admission.

Previous Illnesses.

A year ago, the patient had his appendix removed. It is since this time that he has suffered from periodic attacks of abdominal pain.

There have been no other illnesses.

Family History.

The patient had two younger brothers, and one older sister, all three of whom died from diphtheria.

Social Conditions and Habits.

Since leaving school, the patient has worked as a butcher's assistant. He is contented in his occupation, and has not found it unduly hard or tiring.

He does not smoke, and does not take alcohol.
Examination on Admission. 22/11/40.

T.P.R. 98.4 degs.F. 100/min. 20/min.

General Appearance.

The patient is a young boy, moderately well developed physically. For his age, he seemed to be a little underdeveloped, both in stature and in weight. The face was pale, and the skin moist, with a slightly sallow tinge. Several septic spots were seen on the face and back of the chest.

At the time of examination, the patient was not suffering any great pain.

Alimentary System.

The tongue was clean and moist. There was no noticeable odour in the breath. The teeth were clean, and in good condition.

On inspection of the abdomen, no generalised distension was evident. Movement with respiration was quite satisfactory, although there was some limitation in the region of the right iliac fossa. In this area also, slight fullness was appreciable, especially so in the region of the old operation scar. No other abnormalities were to be seen, and there were no visible protrusions through any of the hernial orifices.

On palpation, the impression of fullness in the region of the right iliac fossa was confirmed. Here, also, marked tenderness tenderness was found, and pressure over the swelling caused the patient much discomfort. On the right side of the abdomen,
some muscle guarding was appreciable.

On percussion, it was found that a tympanitic note was obtained over the area of fullness.

Obturator and psoas tests were negative.

There was no demonstrable enlargement of any of the abdominal organs.

Rectal Examination: Slight tenderness was present, especially when the examining finger was directed anteriorly. No fullness was felt in the pouch of Douglas, and nothing abnormal could be palpated.

Respiratory System.

The chest was well developed, and showed no abnormality as regards configuration. The respiratory expansion was good, being equal on the two sides, and showing no limitation on account of the abdominal condition. Percussion revealed no areas of dullness, and no abnormalities were detected on auscultation.

Central Nervous System.

Both pupils reacted equally to light and accommodation.

Knee and ankle jerks were present and active.

Cardio-vascular System.

The pulse rate was increased, (100/min.), but the pulse was of good volume, and regular in time and force. The vessel wall was not palpable.

The heart was not enlarged, and the valve sounds were closed in all areas.

Urinary System /
Urinary System.

No abnormality was detected. Examination of the urine failed to detect any abnormal constituents.

From the above history, past history and examination, it was considered that the patient was suffering from a degree of intestinal obstruction, which at present was not in a very acute phase. It was decided to employ conservative measures at first, in an attempt to relieve the condition.

22/11/40. After admission, the patient felt quite comfortable. There was no vomiting, and the abdominal pain diminished. In the evening, a soap and water enema was administered, but with a poor and constipated result.

23/11/40. The patient passed a comfortable night. In the morning, a soap and water enema was again administered, with a very good result. In consequence, the patient felt much better. In the evening, however, there was some vomiting, green material with some dark coloured clots amongst it being brought up. The quantity thus vomited was about 8 ozs.

24/11/40. In the evening, the abdomen became rigid, and there was severe pain over the whole of the lower abdomen. There was no vomiting. On rectal examination, great tenderness was found anteriorly, and some fullness was also present.

25/11/40. A flatus enema was given, with no result,
James Galloway.

Straight X-ray of abdomen.
and likewise, there was no result from a soap and water enema. Since the previous evening, the pulse rate had been rising. The face was a little flushed.

A straight X-ray of the abdomen was taken, and well marked fluid levels were seen.

Operation was decided upon.

Summary of the Main Points in the History and Examination.

1. History of appendicectomy 1 year ago, since which time there had been recurrent attacks of colicky abdominal pain.
2. Severe pain developed in the abdomen 2 days ago, associated with vomiting.
4. Fullness, tenderness, and rigidity in the right iliac fossa.
5. Tympanitis percussion note in the same region.
6. Some tenderness on rectal examination.
7. Symptoms and signs subsided after admission, to return two days later.
8. No abnormality detected in any of the other systems.
Operation. 25/11/40. 12 noon.

Premedication: Morphine grs. 1/6, atropine grs. 1/100

Anaesthetic: Nitrous oxide, oxygen, and ether.

Surgeon: Mr. Jardine.

Operation: Relief of intestinal obstruction.

A right paramedian incision was made, below the level of the umbilicus. The anterior layer of the rectus sheath was incised, the rectus muscle displaced, and the posterior layer of the sheath and the peritoneum divided, to open into the abdominal cavity.

Numerous adhesions passing between loops of small bowel, and the abdominal wall were found, in
the right iliac fossa. A large number of tuberculous glands was present in the ileo-caecal region.

A particularly large adhesion was seen to pass to the region of the old appendicectomy scar, and was responsible for the obstruction of a loop of dilated and congested bowel. The part of the gut involved was identified as a terminal coil of the ileum. Not only was it obstructed by the loop, but it was also twisted upon itself.

The bowel was set free by division of the band, when it was seen that a very marked ring of constriction had been produced, although the viability of the loop was not impaired.

It was considered, that the affected area would have to be short-circuited, and accordingly, a loop of ileum, above the site of obstruction was anastomosed to the transverse colon. It was noted that the large bowel was empty and collapsed.

After the anastomosis had been performed, all the remaining adhesions very divided and ligated.

Finally, the wound was closed, without drainage, using catgut, silk worm gut and scotia gut.

The patient's condition after operation was good.
Post-operative Treatment and Convalescence.

25/11/40. Operation at 12 noon.

On his return from the theatre, the patient was placed in a warm bed, well supplied with hot water bottles. In the evening, he became a little restless, and heroin, grs. 1/24 was accordingly administered. This dose was repeated during the night.

26/11/40. In the morning, the patient had an attack of vomiting. The vomited matter was yellowish-green in colour, but was not copious in amount. Considerable discomfort was caused to the patient, as the vomiting was accompanied by much retching.

In the evening, the patient began to feel a little better, and was able to take some fluid by mouth. In general, however, he was very weak, and inclined to be restless.

27/11/40. The patient had passed a fairly comfortable night, gaining some sleep without the aid of sedatives. He complained somewhat of thirst, and was able to take considerable amounts of fruit drinks and milk.

The wound was being dressed daily with a dry dressing.

28/11/40. The general condition was much improved. As yet, there had been no action of the bowels, and liquid paraffin, 1/2 oz. t.i.d. p.c. was prescribed. The diet was still confined to fluids and milk, although the patient's appetite was returning.
29/11/40. Improvement was well maintained. Light articles of diet, such as milk puddings, eggs, etc. were allowed the patient. In the evening, the bowels moved for the first time since operation, with a small result.

6/12/40. Throughout the past week, there had been marked progress. The patient was able to take a lively interest in his surroundings, and was feeling much better. His diet was now more varied, and back to normal. The bowels had continued to move regularly each day. Since operation, the patient had never been troubled with any cough, so that after the first day, he had been reasonably comfortable.

On dressing the wound in the morning, it was noticed that the edges were reddened and tense. The superficial skin stitches were therefore removed.

8/12/40. Much yellow pus began to issue from the wound. The infection seemed to be quite superficial. Boric fomentations were applied four-hourly.

12/12/40. All infection in the wound had subsided, and the fomentations were discontinued, a daily dry dressing being once more applied.

Today, the remaining stitches were removed.

15/12/40. The patient was allowed up for the first time. His general condition was excellent.

17/12/40. The patient was discharged to Convalescent House.
Cases 4 & 5.  

Intestinal Obstruction.

Discussion.

It is proposed to discuss the two foregoing cases together, since they have several clinical features in common:

1. Age of patient,— both under 20 years.
2. Complaint,— abdominal pain of some days duration. Later manifestations were vomiting and constipation.
3. History,— previous abdominal pain experienced.
4. Signs,— tenderness and muscle guarding in the right iliac fossa.
5. Cause of Obstruction,— band.

Age of Patient: When we think of the aetiology of intestinal obstruction, we naturally tend to classify the cases in age groups. Thus, the causes range from intussusception in childhood to carcinoma in middle and old age. The commonest cause of obstruction in adolescents is probably tuberculosis of the intestine or mesenteric glands. Indeed, in one of the above cases, it was noted that there was considerable matting of the mesentery, and glandular enlargement. Intestinal obstruction in any form is not very common in patients between the ages of 15 and 20. At this time of life, the hazards of childhood have been passed, and the morbid conditions associated with adult life have still to be encountered. Thus, on the one hand, obstruction
in a boy of 14 as a result of post-operative adhesions is comparatively rare, and on the other, the formation of an ovarian cyst in a girl of 18 is unusual, and more especially so for it to be the cause of an intestinal obstruction.

**Complaint:** Both patients exhibited the cardinal manifestations of intestinal obstruction:

1. **Pain.** This was colicky in nature, and formed the first complaint. The pain was not well localised until well on in the disease, and it was only some time after admission to hospital that the pain was definitely limited to the right iliac fossa. There does not seem to be any satisfactory reason for this sequence of events. On a purely mechanical basis, it would appear reasonable to assume that following upon obstruction, the part of the bowel immediately proximal to the lesion would be the first to become hyperactive, and that later, the activity would become more generalised. According to this assumption; one would expect pain to be felt locally at first, and diffusely later. The sequence in actual practice is, however, the very reverse. Much still remains to be explained in the causation and distribution of abdominal pain. It will be noted that in both cases, although the pain was severe, it did not assume the great intensity commonly associated with renal or biliary colic.

2. **Vomiting.**

3. **Constipation.** These were later manifestations.
In both cases, they were not present at the time of admission, but reappeared later. The vomiting was progressive, and the constipation absolute.

In James Galloway, one had the opportunity to observe the onset of acute obstruction in all its phases. There can be little doubt that by means of the conservative measures adopted on admission, the obstruction was temporarily overcome, but, two days later, acute pain, followed by vomiting recurred, and repeated enemata failed to yield the slightest result.

**History:** In both, there is a history of similar pain, dating in the case of the boy from a few months subsequent to an appendectomy. This history of previous operation is of great importance, for it suggests the possible cause. A common illustration in many surgical textbooks is one depicting the so-called "ladder pattern" in an abdomen bearing the scars of previous surgical interference. This item of previous history was the only reason enabling an exact diagnosis to be made in this case.

In the record of the previous history of Joan Tristan, it was stated that the patient's menstrual periods had been abnormal, occurring only every two months. In reviewing the diagnosis, after considering the operative findings, the idea that this might have been due to the loss of function in one ovary is tempting. Such an attractive explanation however, cannot be accepted as correct, for it is known that the menstrual cycle is not controlled
by the ovary directly, but through the agency of the pituitary gland. Disorders in the menstrual rhythm of this nature have a functional basis, and are not connected with any local pathology.

**Signs:** Tenderness and rigidity in the right iliac fossa were features common to both cases. In the other abdominal signs, however, there was one important difference.

In the case of James Galloway, there was a localised swelling in the iliac fossa, which on percussion yielded a tympanitic note. In the light of the subsequent operative findings, it must have been due to dilated coils of small intestine, for the large bowel was collapsed, and the obstructed loop was part of the terminal ileum. Whether or not it was the actual loop involved that caused this hyper-resonance is not certain, although the lesion was definitely situated in this region. It is taught that in large bowel obstruction, one of the signs is dilatation of the caecum, demonstrable by a resonant percussion note. Thus, it would appear that, taken by itself, this sign would prove to be open to fallacy. The rapid onset of acute symptoms, and the absence of abdominal distension, however, point to an obstructive lesion in the small bowel.

In Joan Tristan, no actual swelling was visible in the region of the iliac fossa, but there was a definite palpable mass. This was dull on percussion. Later, on re-examination, it was found that there had been an appreciable and rapid
movement upwards towards the right costal margin. This factor might have suggested that the cause was other than an appendix abscess, although it is most unlikely that the actual nature of the condition could have been diagnosed prior to operation.

**Cause of Obstruction:** Finally, we have seen that in both cases, the actual cause of the condition was obstruction by means of a band. In one patient the band was in the nature of an adhesion, while, in the other, it was the stalk of an ovarian cyst.

**Diagnosis:** The two cases are in all respects similar, with but three exceptions:—

1. Previous history of operation in one patient.
2. Sex.
3. Mass palpable in one case.

Although in James Galloway an accurate diagnosis was made prior to operation, it is not likely that the true state of affairs could have even been suspected in the case of Joan Tristan.

**Treatment.**

By medical means, James Galloway obtained temporary relief, and although operation was subsequently necessary, he came to the table in a much improved general condition.

Joan Tristan, on the other hand, was operated on within a few hours of admission. There are two main criticisms to offer as regards treatment in her case:—
1. The importance of pre-operative treatment and preparation was not realised. No attempt was made to aspirate the stomach contents, with the result that "vomiting which had developed a few hours previously, persisted throughout the major part of the operation. Vomited material had on several occasions to be removed from the mouth and throat with swabs and suction." Reference to this aspect of treatment has been made in more detail in a previous case, but the point is again emphasised as one deserving attention.

2. The ovarian cyst was allowed to rupture. While many such cysts are of a benign character, it is the practice of many experienced gynaecologists both in this country and abroad, to remove them intact, rather than to tap them first. There is always the danger of malignancy, and several cases have been recorded where there has been extensive malignant involvement of the peritoneum as a result of the escape of their contents at operation.

In the post-operative periods, both patients made satisfactory recoveries, although, one feels again, that in the case of Joan Tristan, more active measures might have been taken to correct dehydration.
Case 6.

Name of Patient: - Charles Cooper. Aet. 52.

Admitted to Wd. 18: - 29/11/40.

Complaint: - Abdominal pain and vomiting.

Diagnosis: - Perforated sarcoma of small bowel.

Treatment: - Colostomy.

Result: - Death.
Case 6. Sarcoma of Small Bowel.

Patient's Name: Charles Cooper, Aet. 52.
85 Dalmeny Street,
Leith.

Recommended by: Dr. Jamieson
34 Albany Street,
Leith.

Admitted to Ward 18: November 29th, 1940.
Complaint: Abdominal pain and vomiting—duration 6 days.
Occupation: Unemployed.

History of Present Condition.

Six days ago, (23/11/40), the patient started to vomit, and this vomiting continued periodically for five days. At first, the patient was able to gain some nourishment, but, for the last three days, anything taken by mouth was immediately regurgitated. To begin with, the vomited material was yellowish in colour, but later became darker.

The vomiting was associated with a continuous dull pain in the upper abdomen, on both sides, but more especially on the right.

With the onset of the vomiting, the bowels became constipated, and not even flatus was passed.

The patient suffered a great deal from thirst, especially in the last 2-3 days. Throughout the whole period, the patient steadily lost strength, and since the onset of symptoms, had to remain in
bed.

For about a year prior to this attack, the patient had been feeling unwell, always lacking in energy, and feeling tired. Just prior to this, he had had an attack of influenza, and to the after effects of this he ascribed his lassitude. For some months, he had been unable to work. As a result of his illhealth, his digestion had been upset, and he had been forced to live on the lightest of diets. Even with these precautions, there had been frequent attacks of nausea and loss of appetite, although he had not been troubled with actual vomiting.

Previous Illnesses.

Until 1 year ago, the patient had always been perfectly healthy.

In 1938, the patient had a severe attack of influenza, and since then has never felt in good health.

The patient has had a chronic cough for a number of years.

Family History.

The patient's father died from malignant disease in the abdomen.

Habits.

The consumption of alcohol and tobacco are both stated to be moderate.
Examination on Admission. 29/11/40.

T.P.R. 99.2 degs.F. 108/min. 22/min.

General Appearance.

The patient was a small, but fairly well developed middle aged man. He was very pale, and looked severely ill. As he lay in bed, he tossed and turned repeatedly, and groaned occasionally. The skin over the body was dry and loose, the eyes were sunken, and the mucous membranes lacked moisture.

Alimentary System.

The tongue was dry and heavily coated with a white fur. Many of the teeth were absent, and those that remained were badly decayed. The surrounding gums were in a septic state. The breath was foul, and had an "abdominal" smell.

On inspection of the abdomen, there was only slight movement with respiration. Some abdominal distension was evident. No abnormal swellings were to be seen, and there were no protrusions through any of the hernial orifices.

On palpation, generalised muscle guarding was appreciable, and there was diffuse tenderness. The tenderness was, however, most marked in the upper abdomen, on the right side. The muscles of the upper abdomen were rigid on both sides, but here again, rigidity was maximal on the right side.

On light percussion, no diminution of liver dullness could be demonstrated, and there was no evidence of shifting dullness in the flanks.
No areas of hyperaesthesia could be demonstrated.

Rectal Examination: There was no tenderness of the pelvic peritoneum, and no abnormal swellings could be felt. There was no enlargement of the prostate.

Respiratory System.

The chest was well formed, but moved little on respiration. No other abnormalities were to be seen on inspection.

On percussion, there was slight dullness at the left base.

On auscultation, diffuse rhonchi and crepitations were heard on both sides, and were considered to be due to a condition of bronchitis.

Central Nervous System.

Both pupils reacted equally to light and accommodation.

Knee and ankle jerks were present and active.

Cardio-vascular System.

The pulse rate was increased, (108/min.), but the pulse was regular in time and force. The volume was poor. The vessel wall was not palpable at the wrist. The blood pressure was low.

The heart was not enlarged. The valve sounds were soft, but closed in all areas.

Urinary System.

No abnormality was detected. There were no symptoms referable to this system, and examination of the urine revealed no abnormal constituents.
From the above history and examination, no exact diagnosis could be arrived at, although it was clear that the patient was suffering from acute intestinal obstruction. It was decided to do a laparotomy.

**Summary of the main points in the history and examination.**

1. Abdominal pain and vomiting of six days duration.
2. Pain situated in the upper abdomen, especially on the right side.
3. Symptoms accompanied by absolute constipation.
4. History of ill-health for about a year.
5. Patient feeble and dehydrated at the time of examination.
6. Some distension of the abdomen.
7. Tenderness, muscle guarding and rigidity present. All maximal on the right side of the upper abdomen.
8. Pneumonitis present in the chest.
9. No abnormalities in any of the other systems.
Operation. 28/11/40. 10 p.m.

Premedication: Morphine grs. 1/4, atropine grs. 1/100
Anaesthetic: Nitrous oxide, oxygen and ether.
Surgeon: Mr. Tulloch.
Operation: Laparotomy.

A lower right paramedian incision was made, the rectus sheath incised, and the rectus muscle retracted laterally. The peritoneum was then cut, and the abdomen opened. Coils of acutely dilated small intestine were immediately seen. A hand was passed into the right iliac fossa, but the caecum could not be felt. The small intestine was then carefully traced upwards from the ileum towards the jejunum, and the site of obstruction located. At this point, the bowel was adherent to the abdominal wall on the left side, and in the same region, some pus was present in the peritoneal cavity.

The paramedian incision was then closed, and a left grid-iron incision made. By this means of approach, the bowel at the site of obstruction was found to be adherent, not only to the parietal peritoneum, but also to the descending colon. The adhesions were gently broken down, but the obstruction was still unrelieved. A hard mass was then felt in the bowel at this point, and it was accordingly exteriorised, along with a loop of bowel. The mass was hard and irregular, and in the middle of it there was seen to be a small perforation, about the diameter of a straw. Enlarged glands were present in the mesentery.
Bowel exposed at operation.
The obstructed loop was stitched to the sides of the incision, and the wound closed round about it. The loop was then opened, and the obstruction thus relieved. Much fluid bowel content escaped.

The patient's condition was very poor, the pulse being rapid, and the blood pressure low.

Post-operative Treatment.

29/11/40. Operation at 10 p.m.

On returning from the theatre, the patient was placed in a warm bed, and propped up in a sitting position. Additional warmth was gained by means of hot water bottles, and an electric cage. The head of the bed was raised on blocks.

Normal saline, containing 5% glucose was administered by means of a continuous intravenous drip.

30/11/40. The patient's condition was still very poor. The pulse was weak and irregular. In addition, he had developed a troublesome productive cough. 10 c.c. of Soluseptasine (May and Baker) were given intravenously. Mist. ammon. carb. 1/2 oz. q.q.h. and Coramine 1 c.c. q.q.h. were prescribed.

Glucose saline continued to be given intravenously. The loop of bowel was discharging very fluid contents and fluid taken by mouth was soon passed into the dressing.

1/12/40. The pulse was still poor, although stronger than it had been previously. Although the patient felt a little stronger, he was troubled by a
frequent cough. He was taking some fluid by mouth, and was managing to absorb some of it. He had not been troubled with vomiting since the time of operation.

2/12/40. The general condition was much improved. The pulse was slower, and of much better volume. For the first time since operation, the patient had slept at night without the aid of morphine. The cough was a little improved, and was not so frequent. Much fluid was still being discharged from the opening in the bowel, and in spite of frequent dressing, the skin was becoming a little excoriated.

3/12/40. In the morning, the patient was much better, having had another good night. Towards the evening, however, his condition started to deteriorate, the pulse becoming more rapid, and the cough once again becoming more troublesome.

A small specimen was taken from the margin of the perforation, and sent for pathological examination.

4/12/40. The patient failed to show any signs of improvement. He had passed a restless night, and was now weaker and dispirited. The cough was more severe, and occasioned much discomfort. In spite of careful dressing, and the application of zinc and castor oil ointment, the skin around the wound was becoming markedly excoriated. Altogether, the patient was most uncomfortable.

5/12/40. The general condition was much about the same. The patient's condition was very pitiable, for
although very weak, his mind was clear, and he was becoming very anxious about himself.

He had started to vomit again, and this, in combination with the great loss of fluid from the bowel was leading to rapid dehydration, in spite of the fact that saline was being given continuously by the intravenous route.

Blood was taken for an estimation of its urea and chloride content.

6/12/40. The patient was very much weaker. An ominous sign was that he was no longer coughing, and the breathing was becoming distressed. The pulse was very weak, and of low pressure.

In the evening, the temperature had dropped, as had the pulse rate. The breathing was slower, and after a period of confusion, the patient lost consciousness.

He died a few hours later.

Biochemical Findings.

6/12/40. Blood chloride:– 310 mgms.%

Blood urea N :– 16 mgms.%

6/12/40 Blood CO₂ combining power:– 66 vols.%

Pathological Findings.

Report on Biopsy Specimen:–

"The specimen consists of granulation and scar tissue, widely infiltrated with polymorphs and round cells. The picture is that of a healing, but
nevertheless, still active inflammatory condition.

In the section examined, there is no evidence of malignancy!

**Summary of Post-Mortem Findings.**

**Alimentary System.** Peritoneum: There was slight peritoneal reaction in the region of the tumour, to be described later. Oesophagus, stomach, and duodenum: Were congested, but apart from this were normal. Small Intestine: Five feet from the duodeno-jejunal junction, there was a thickening of the gut, and some adherence to the surrounding coils of intestine. Proximal to this, the gut was distended and plum coloured and to a lesser extent this colouration extended below the tumour mass. It was, however, this part of the intestine which was taken out as a loop in the left inguinal region. When this part was opened up there was a circular tumour seen 4 cm. across, with smooth edges and no apparent infiltration of the nearby gut. The centre of this tumour had perforated. The nearby mesenteric glands were enlarged and on section were grey, but this may possibly be oedema, as the tumour has rather a benign appearance. Sections have been taken. Part of the pelvic colon was adherent to this tumour mass, and to the parietal peritoneum. The adhesions were of recent formation and the pus was localised. There was no intrinsic lesion of the pelvic colon itself, and the rest of the alimentary tract was
Histological Section.

L.P. photomicrograph showing numerous round cells. The vascular nature of the tumour is also evident.
normal.

**Respiratory System.** Trachea and Bronchi: were congested.

Lungs: Right lung weighed 600gms. left 480gms.

Both lungs were nodularly firm in the posterior aspects and on section this was found to be due to broncho-pneumonia. The pleura corresponding was inflamed. The rest of the lungs showed generalised congestion.

**Microscopic Report.**

Tumour of Small Intestine: The tumour has no definite pattern. The cells are pleomorphic but mainly large, sometimes more spindle-shaped and fibroblastic looking than the normal round shape. Where the former shape is predominant, the reticulum is marked, in the latter, it is almost absent. The round cells have large nuclei, sometimes more than one, with open meshed chromatin. The tissue is vascular. The tumour is a reticulum cell sarcoma.
Case 6. Sarcoma of Small Bowel.

Discussion.

History.

Unfortunately, only the barest outline could be obtained as to the history of this patient's condition. From the time of admission, until death occurred, some nine days later, the patient was very seriously ill, and it was not felt advisable to add the additional strain of repeated interrogation and examination.

We find that for about a year previous to the appearance of the acute symptoms, there had been general complaints, in the form of debility and lassitude. The digestion was easily upset with any but the lightest of diets, and there were frequent attacks of anorexia and nausea. No actual vomiting occurred. All these symptoms dated from an attack of influenza. In addition, it was noted at the time of admission, that the patient was markedly anaemic.

The question arises, as to whether the sarcomatous change in the bowel could in any way have been associated with these general manifestations. It is well known that influenza is often followed by a prolonged period of debility, and this may in part have been responsible for the patient's condition. Ill-health from this cause alone, however, is not likely to have been so persistent, and it therefore seems justifiable to assume that the malignant
condition in the bowel was responsible, at least in the latter months. Several writers have observed that malignant growths in the region of the jejunum are commonly associated with intermittent attacks of partial obstruction, a progressive anaemia and occult blood in the stools (C.W. Mayo, and W.S. Nettroir; Surg. Gynecol. & Obst. 1938, Jan. 108).

Symptoms of obstruction, with melaena or occult blood were the commonest findings in a series of cases investigated by F.G. Medinger (Surg. Gynecol. & Obst. 1939, 69, 299).

Other workers state that the symptoms usually complained off are vomiting, poorly-formed actions of the bowels, malaise, and intermittent twinges of pain (E.D. Kiefer; New Eng. Jour. Med. 1933, May 1042: H.W. Cave; Ann. of Surg. 1932, Nov. 924).

Some of these symptoms are present in this case, and one may therefore assume that the patient's previous history was, in part at least, caused by the sarcomatous growth. The anaemia by itself would afford sufficient cause, and some degree of partial obstruction probably aggravated the digestive upset.

Acute symptoms developed 6 days before admission. Progressive vomiting developed, there was some dull pain in the upper abdomen, and absolute constipation was present. As has been seen in some of the other cases described, these features form the typical triad in acute intestinal obstruction. There was a marked and rapid deterioration in the patient's general condition. This may be ascribed
to two causes:
1. The poor general health prior to the onset of the acute manifestations.
2. The fact that the jejunum was the site of the obstruction.

The site of obstruction has a great bearing on the mortality in intestinal obstruction, and this in turn is intimately connected with the loss of electrolytes from the body. The so-called Draper-Maury line or "lethal line" is situated just distal to the entry of the bile and pancreatic ducts into the duodenum. Obstruction at this site is very rapidly fatal, and the nearer an obstruction is to this area, the more dangerous it becomes.

The patient complained of great thirst, especially in the last few days, and no fluid that he managed to retain helped it to any great extent. Dehydration, therefore, was a prominent complaint. If one compares the condition of this patient at the time of admission with that of Thomas Renwick, (Case 3), the importance of the site of obstruction becomes obvious. In both, acute symptoms had been present for about the same length of time, and yet, whereas the latter looked and felt comparatively well, the former was pale, with wrinkled skin, and sunken eyes, and in a very wretched and restless mental state.

To summarise the points in the history of this case, we can say that the symptoms of jejunal neoplasm are those of general weakness and
malaise, with progressive anaemia and gastro-intestinal upset. With the onset of obstruction, there is rapid deterioration in the patient's condition, and early development of marked dehydration.

**Examination.**

A thorough local and general examination failed to further the diagnosis. The most striking feature was the patient's mental outlook,—one of extreme uneasiness and despair. The patient looked many years older than his actual age, the skin being dry and wrinkled, and the eyes sunken. All these were features of an extreme dehydration, coupled with the exhaustion resulting from prolonged vomiting and sleeplessness.

Abdominal examination revealed some slight abdominal distension, with widespread tenderness. All the signs were maximal on the right side of the upper abdomen. This state of affairs is peculiar, in that the site of the lesion was later found to be in the left iliac region. The most probable explanation seems to be that the loops of bowel above the obstruction must have been situated towards the right part of the abdomen. The only other important points were:

1. Percussion failed to reveal any distension of the caecum, thus excluding any obstruction of the large bowel, the caecum being the "barometer of the large intestine".

2. The commonest cause of intestinal obstruction,
namely, external hernia, was excluded by a careful examination of all the hernial orifices.

Diagnosis as to the nature of the condition was thus almost totally impossible. The most that could be said was that acute high intestinal obstruction existed in a patient already suffering markedly from the results of continued fluid loss.

On studying what literature there is on this condition, one finds the statement "Pre-operative diagnosis is seldom made, but modern radiological methods help towards a recognition." (E.D. Kiefer). Radiology could not be attempted in this case on account of the acute symptoms. It is therefore, hardly surprising that with such vague and misleading local symptoms and signs, the operation undertaken was of the nature of a laparotomy.

Operative Findings and Treatment.

Pre-operative Treatment.

In this case, as in others already discussed, the pre-operative phase of treatment was almost entirely neglected. It would appear necessary to emphasise that warmth and the pre-operative administration of morphine does not constitute adequate pre-operative treatment. The patient's condition was bad before operation, and it deteriorated markedly in the course of the surgical treatment.

There can be no doubt, that the performance of a major abdominal operation within a few hours
of this patient's admission to hospital was a mistake. As an alternative, the following scheme of treatment is suggested:

1. Rest in bed, with warmth supplied by an efficient shock cage.
2. The continuous administration of adequate amounts of fluid and glucose intravenously, e.g. normal saline with 5% glucose.
3. Estimation of the haemoglobin content of the blood at the outset, for in this case, anaemia played a considerable part. The addition of 2 pints of blood to the intravenous drip would undoubtedly have had a beneficial effect.
4. Aspiration of the stomach contents, the amount of fluid obtained being carefully correlated with the extent of the intravenous therapy.
5. Examination of the lungs, and circulatory system for any signs of embarrassment.
6. Charting of the blood pressure readings at frequent intervals, to estimate the response to treatment.
7. Recording of the pulse rate at 1/2 hourly intervals.

It seems reasonable to expect that with treatment along these lines, there would have been a steady improvement in the patient's general condition. When this had occurred to the maximum extent possible operative interference would be justified.

Operation.

A tumour in the jejunum was found, causing
obstruction of the lumen. The site of obstruction was exteriorised, and an opening made into the bowel proximal to the growth. The obstruction was thus relieved.

From the time of operation, until the patient's death, there was a constant outpouring of very irritant fluid. As a result, the patient lost much fluid and salts, and was constantly uncomfortable, the skin around the wound soon becoming irritated, and later eroded.

The contents of the jejunum are always of a very fluid nature, and in view of the large content of digestive ferments, are highly irritant to the skin. The loss of fluids and electrolytes becomes of serious consequence when occurring in an already dehydrated patient. On account of this factor, there arises the question as to whether any alternative procedure could have been adopted. A short-circuiting anastomosis might have been considered, the tumour mass being left undisturbed in the meantime. This line of treatment was not undertaken, although it was considered, on account of the poor general condition of the patient, but had more active pre-operative steps been taken, this form of treatment would have been quite possible. After about a week or so, during which time attention was once more directed towards the general condition, a second operation for removal of the growth might be considered. Such a line of treatment has been suggested by F.H. Lahey. (Med.
Post-operative Treatment.

During the first four days, the patient steadily improved, due in part to the relief of the obstruction, and more especially, to the parenteral administration of saline and glucose. At the end of this period, however, there was a rapid decline, leading to death on the ninth day.

The operative mortality in this condition is high, - 47.4% (F.G. Medinger), but there are two possible lines of treatment which might have helped in this case: -

1. The insertion of a tube into the jejunum, distal to the site of obstruction. By this route, a valuable means of administration of fluid and light nourishment would have been obtained.
2. The performance of a lateral anastomosis before the patient's condition started to decline.

It is hoped, that the criticisms expressed in this discussion will not be subject to the accusation of "being wise after the event". Rather are they an attempt to suggest a more suitable line of treatment to be adopted in future cases presenting the same problems.

In conclusion, some of the characteristics of sarcoma of the small bowel, as seen in this case may be summarised:-

1. Age of patient: in middle life.
2. Sex: male.
3. Symptoms of general weakness and malaise with progressive anaemia.
4. Occurrence of obstruction.
5. Absence of diagnostic features, and consequent inability to arrive at an exact pre-operative diagnosis.
Conclusion.

To round off the discussions in the foregoing cases, a few words of a more general nature might be added.

In the past few years, much stress has been rightly laid on the necessity for early diagnosis, and there is no doubt that this plea has yielded some good results. But, no matter how prompt diagnosis becomes, there will still remain that group of cases where the medical attendant has not been summoned until the illness is already well advanced, and where valuable hours have been lost while the patient tries his own homely remedies. Indeed, it is perhaps true to say that many lives have been lost through too great faith in the powers of the hot water bottle, and the dose of castor oil.

A reduction in the mortality of this type of case can only be achieved by vigorous pre-operative measures. The treatment of a perforated ulcer must come to mean more than the mere repair of the damage, and the post-operative placing of a shock cage over the patient. In recent times, the energetic measures employed in the treatment of shock in cases with severe burns have been attended with remarkable success, and there is no reason why in the field of emergency abdominal surgery a similar improvement should not be looked for.
Abdominal surgery only became a practical possibility with the discoveries of Young and Lister. Since that time, much attention has been turned to the local surgical problems, and one feels that even now, not enough attention is paid to the general condition of the subject for operation.

At the present time, we are continually hearing of the new era to come after the war. Perhaps, in the field of surgery, the new era, will be marked by a greater attention to the pre-operative and post-operative measures, and less to the actual operative technique.
Bibliography.

6. Index of Differential Diagnosis. Edited by Herbert French.
8. The Early Diagnosis of the Acute Abdomen. Zachary Cope.
12. The Medical Annual. 1820 to 1940, inclusive.