
Gastro-Intestinal Neoplasia and its Differential Diagnosis
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Diagnosis of malignant growths of the gastro-intestinal tract may be easy but it may be extremely difficult, even with all the ancillary aids of endoscopy, cytology and radiography. Sometimes even when the patient reaches operation the exact nature of the condition may still be in doubt, and the final diagnosis may rest with the pathologist. In this series of six cases, all run in the same surgical unit of the Royal Infirmary of Edinburgh within a period of a few weeks, three demonstrate malignant growths unsuspected on investigation and three benign lesions originally diagnosed as malignant.

Case No. 1: Gastric Carcinoma

Mr. William Milrose, aged 59
4 Waverley Park,
Edinburgh

Doctor S. Mone,
27 Bellevue Place,
Edinburgh

Occupation: Ticket-collector for British Railways
Admitted: 8/2/61
Examined: 13/2/61

Complaints:
1. "Heartburn" for the last 20 years
2. Vomiting blood on several occasions in last 3 months

History:
Since 1941 Mr. Milrose has been suffering from attacks of "heartburn" every 4 to 6 weeks. By this
he means regurgitation of food into his mouth and a
unexplained burning sensation, not amounting to pain.
Thus episodes lasted a few days and were not
always related to meals - the "heartburn" occurred
at variable times in the day but never at night.
If it occurred before a meal the food alleviated
it. Being a ticket-collector, Mr. Melrose's meals
were very irregular and during the day he existed
on a "flex" row and then fatty foods tend to
make the heartburn worse, but it is unaffected by
sleeping or lying down. It is relieved by taking
Gregory's powder and other similar prophylactic
preparations. The discomfort has never radiated to the
epigastrium or the back and there has never been
any jaundice. The patient very seldom vomited
until 3 months ago and if he did it was
merely food he had eaten a short while before
with no blood, and not in large amounts. His
doctor was treating him for "chronic dyspepsia."

On the 27th December 1960 he vomited
half a pint of blood at midnight and was
admitted to Ward 29 of the R.I.E. He had felt
very restless just before this happened, and his
motions had been dark in colour for the previous
week. He was given a blood-transfusion and some
X-rays were taken and as there were no further
episodes he was transferred to the Chesty Clinic on
the 12th of January. However, he did not get an
very well there - the pork and liver for meals
"disagreed" with him. He had three episodes of
coffee-ground vomiting before meals in one week and
was readmitted to Ward 29 on the 6th of February.
He had another episode on the following day and was
transferred to Ward 10. He was operated on a few
days later and told that an ulcer had been found.
Since then he has been having sweaty turns after meals but is passing wind and is not uncomfortable. He has vomited small amounts of coffee grounds material about once a day since operation.

Personal History:

Bowel - regular but black - has been told this is probably due to iron. No diarrhoea, no red blood in the stools.

Micturition - no frequency, nocturia, dysuria or haematuria.

Appetite - poor for last 3 months but moderately good before then.

Weight - about 2 stone lost in last 3 months.

Sleep - poor, mainly because of painful "fibrositis" in left shoulder for last 3 months.

Cough - more before operation but now a little yellowish sputum tinged with blood.

Mr. Melrose has been feeling very tired for the last five months and has had slight breathlessness on exertion but no ankle swelling. He has also been very tense and anxious. He smokes about 20 cigarettes a day and is a moderately heavy drinker of whisky rather than beer.

Past History:

1917: Hemiplegia operation.

1928: removal of glands in the neck.

1950: "Nervous breakdown" - given phenobarbitone and tranquilisers.

Has never had rheumatic fever, slight arthritis, tuberculosis or other serious illnesses or operations.

Family History:

Mr. Melrose is married but with no family. His wife, 2 sisters and 3 brothers are all well. One brother had a gastrectomy for an ulcer at the W.C.H. 2 years ago. His mother died at 63 from a haemorrhage after many years of indigestion. His father died at 68 from gangrene.
Examination:
At very tense, anxious-looking, thin man with highly coloured cheeks but pale mucous membranes. No cyanosis and no jaundice. Slight finger clubbing. Deep system's contractile involving 1 index and little finger and 2 index, ring, and little finger and middle finger to a lesser degree. Extremities warm.

Gastrointestinal system: The tongue is normal and there is some factor of the breath. The abdomen is smooth and move on respiration and appears slightly distended. An old 2 hernia scar and a recent upper 3 paramedian scar are visible. There is no obvious peristalsis.

There is no tenderness on palpation. Liver, spleen and kidneys were not palpable & no abnormal masses were felt. There was no inguinal lymphadenopathy. No splashing was elicited.

Bowel sounds were normal and a rectal examination negative.

Cardiovascular system:
Pulse 112/ min., regular in time and force, good volume BP 140/90 mm. Hg
Apea beat in 6th intercostal space, 2 in. outside midclavicular line but giving normal impulse.
Two heart sounds heard in all areas with a blowing systolic murmur maximal at the apex.
Regulated venous pressure not raised, no ankle or sacral oedema.

Respiratory system:
Chief asymmetrical, trachea central, moderately good expansion. Respiration rate resonant, breath sounds vesicular with inspiratory expirations at bases.

No palpable thyroid, no exophthalmos or lid lag.

Central nervous system:
Intestinal nerves, motor & sensory tracts intact.
Reflexes brisk and equal. Plantar flex.
A round, smooth, stony-hard gland the size of a small marble is palpable above the medial third of the right clavicle behind the sterno-mastoid and a smaller, softer gland more laterally placed.

Differential Diagnosis:

This is easy to make in retrospect as this examination was performed after the results of the laparotomy were known. Before then, gastric neoplasm was unsuspected.

1. Gastric carcinoma
2. Duodenal ulcer
3. Gastric ulcer

Investigations:

1. Haemoglobin: 50% on 31/12/61 - given 3 pints blood; 63% on 6/2/61 - given 3 more pints; 75% on 13/2/61

Blood group A -ve, so requested not to transfuse unless absolutely necessary.

2. ESR: 50 mm/1st hour.
3. WCC: 12,500/µl. mm.
4. Faecal occult blood: -ve on 31/12/61
   +ve on 6/2/61
   strongly +ve on 7/2/61
   still +ve on 13/2/61

5. Urine: no albumin, sugar, acetone, cells or crystals
6. Barium meal on 23/12/60 showed "marked deformity of the duodenal cap but no actual ulcer itself"
7. Laparotomy on 9/2/61:

   An upper paramedian incision was used, the rectus split and the peritoneal cavity opened. A small ulcer was found on the anterior surface of the duodenum and the lower sac opened as
the first step in gastrectomy when a large carcinoma arising from the posterior wall of the stomach was revealed. It involved the spleen and the posterior abdominal wall, and there were secondary deposits in the liver, so gastrectomy was abandoned and the wound closed in layers.

Further Progress:
Vomiting of small amounts of coffee-ground material once or twice a day continued. 24/2/61 Sudden severe pain in chest with dyspnea. Chest X-ray showed elevation of R hemidiaphragm, patchy consolidation of R lower lobe and a small area of consolidation in L lower lobe. His condition rapidly deteriorated and he died on 25/2/61. A clinical diagnosis of pulmonary embolism was made.

Discussion:
Carcinoma of the stomach is the commonest malignant growth of the gastro-intestinal tract, but this case shows the difficulty in diagnosis and especially the almost insurmountable difficulty in diagnosing early enough for treatment to be effective. This helps to explain why the survival rate for gastric carcinoma even when considered operable is less than 5% after 5 years.
An insidious onset in carcinoma of the stomach is unfortunately very common, but it may present as vague indigestion for the first time in a patient over 40, as upper abdominal or pyloric obstruction or by extragastric manifestations such as painless jaundice, ascites or superficial thrombophlebitis or merely as an abdominal mass. Haematemesis and melena may be a presenting
symptom as in this case. The differential diagnosis is then from other conditions causing bleeding from the gastrointestinal tract. Avery Jones gives the causes of such bleeding in order of frequency as:

- Chronic peptic ulcer - 65%
- Acute peptic ulcer - 30%
- Asphagael varices
- Carcinoma of stomach
- Peptic ulcer in a Meckel's diverticulum

In this case the history, at least until 3 months ago, certainly suggested a chronic peptic ulcer and statistically this would take first place in the explanation of a haematemeis. In fact the bleeding may have come from the ulcer itself and the carcinoma may have caused only the anaemia, fatigue and loss of weight though it is significant that the bleeding started quite suddenly 3 months previously while heartburn had been present for 20 years.

The other causes of haematemeis need hardly be considered. To postulate an acute peptic ulcer as the cause would be to impose an unnecessary and unlikely third pathology on a stomach already having ample reason to bleed. Asphagael varices are unlikely because there are no other signs of portal hypertension although varices and peptic ulcer may be found together. Peptic ulcer in a Meckel's diverticulum and the same haematological causes can be ruled out by the history and examination.

In retrospect there were many signs
pointing to gastric carcinoma, though even the very large Virchow's node was not felt till after laparotomy, though it must have been present long before. The finding of this enlarged lymph node is virtually pathognomonic of gastric carcinoma, though it may occur with nephrosis elsewhere in abdomen or thorax. However, even if the gland had been noted earlier it would have made little if any difference to the final outcome— even regional lymph node involvement cut down the 5-year survival rate in fully operable growths from 40% to 10%.

The loss of weight and anaemia might also have served to make an earlier diagnosis. The raised ESR should have suggested this on first admission, as an uncomplicated peptic ulcer rarely causes such a rise. Tiredness, weakness and anaemia are all typical of the insidious growth. (The anaemia probably contributed to the raised ESR but is unlikely to have been the only cause.) Symptoms of anaemia, anorexia and asthenia also occur in pernicious anaemia and uraemia but these were excluded but by a hypochromic microcytic blood picture and a normal blood urea nitrogen. The haemoptysis and breathlessness might suggest blood borne metastases as well as other spread but this was not confirmed by the terminal X-ray.

The original leishmanum is not altogether typical of a duodenal ulcer, but very few cases are completely typical. The discomfort was not severe, not related to meals and did not wake the patient at night and it was associated with a good appetite, maintenance of weight and no vomiting. The last three facts are often found,
however, in the history of a duodenal ulcer. In spite of this atypical history it is hardly justifiable to label this case "nervous dyspepsia" without further investigation — and the patient went 20 years before having an X-ray. It is just possible that had this been done earlier, further treatment might have been carried out and the carcinoma found early or even prevented by partial gastrectomy for the definite rules. One must admit, however, that Mr. Mulroe's symptoms were slight and he was of a rather anxious, worrying nature likely to favour a functional diagnosis.

The association of a gastric carcinoma with a duodenal ulcer is rather uncommon, for one is a deniscence of atrophic gastric mucosa with poor acid secretion while the other is characterized by a very high acid secretion. It may be that this very irritation from years of hyperacidity that caused the malignant change in the mucosa. Atrophic gastritis is known to occur frequently following longstanding duodenal ulcer and 25% of gastric ulcers have been shown to follow such a sequence of events. Thus in this case there are two possibilities: a gastric carcinoma arising de novo or a malignant change occurring in a gastric ulcer secondary to a duodenal ulcer. The proportion of gastric ulcers becoming malignant is hotly debated but it is generally agreed now that only about 5% do so, so the second suggestion is less likely than the first, though presenting a temptingly straightforward aetiological sequence.

Unfortunately no test of gastric acidity
was made in this case so the exact level of 
acid output is unknown. It is almost certain 
to have been low because of the carcinoma 
rather than high because of the duodenal ulcer. 
Gastric carcinoma usually rarely gives more than 
high normal levels of acidity. Low or about 
normal acidity carries a much worse prognosis than 
such a high normal figure. If the level had 
been fairly high here the carcinoma might have 
been present for much longer than 3 months, 
attaining its large size by slow growth. If, 
on the other hand, the mucosa was already 
the acid secretion low it might have grown 
with great rapidity, possibly explaining its failure 
to show on the X-ray in December.

The aetiology of gastric carcinoma is 
almost completely unknown. It is a disease of 
civilised man and possibly related to diet or 
alcohol. A greater frequency has been shown in 
ancestors, but not so convincingly as in carcinoma 
of the lung. It is three times as common in 
males and the highest incidence is between 40 
and 60. Mr. Meheux was a man of 59, 
smoking 20 cigarettes a day and a "moderate 
drinker", and it is interesting to note too that 
his blood group was A. Professor Ian Chisholm has 
shown that a higher proportion of group A 
patients have carcinoma of the stomach than 
group O. The reverse seems to be true for 
simple peptic ulcer. It has been worked out 
that being group A carries a 39% greater risk 
of gastric carcinoma than group O. 

About one-quarter of gastric carcinomas 
arise in the body of the stomach as in this 
case. The most common site is prepyloric or the
least common the fundus. The growth may be proliferative as base or an ulcer, an infiltrative growth or a colloid carcinoma. A small number of cases has been described in which the growth has been confined entirely or mostly within the mucous membrane. These early lesions, often found in close proximity to a chronic simple ulcer are divided into carcinoma in situ and superficial spreading carcinoma. Prognosis after operation seems to be better in these cases but diagnosis is extremely difficult.

Treatment in this case was impossible beyond supportive measures such as maintenance of the haemoglobin level. Noting the Dyspeptic’s contracture was of academic interest only as even if the patient had not died so suddenly, palmar fasciectomy would not have been worthwhile, in spite of the considerable disability. (The occupational therapy as to etiology of this condition has fallen into disrepute, but it is interesting to note the possible connection with punching tickets - though it is unlikely that he punched tickets with both hands!)

The only possible treatment for gastric carcinoma at the moment is operative resection. The figures already quoted show how hopeless this is, although with improved technic some claim a survival rate of up to 12% (Pack, 1951). A "curative" resection consists of removing a block of tissue including the growth, a margin of at least 1/2" beyond its palpable limits and the related lymph nodes. This may be done by a radical total, upper or lower gastrectomy. Palliative procedures include resection of the growth itself, gastro-enterostomy to relieve a pyloric block, and short...
circumstance of the cecum, if necessary with a long Roux-en-Y jejunal loop.

In view of the very poor prognosis in this case, death from a pulmonary embolism might be considered a mischievous occurrence, sparing both the patient and his relations a terrible last few months. The fatal embolism occurred on the 15th postoperative day - rather later than the classical 7-10 days. It is thought that many small symptomless emboli occur in many cases but a large embolus accounts for 2-3% of all hospital deaths. In spite of the gross infarction very often there is little to see on X-ray as in this case. Death occurs from complete obstruction of the respiration or ventricular fibrillation. The source of the embolus is usually thrombus in the veins of the calves, thighs, or pelvis but was not obvious in this case. Abdominal or pelvic operations are more often implicated than other surgical procedures but it occurs in medical wards. Lesions predisposing to a sluggish circulation such as immobility of of pressure on the lower limbs and dehydration should be avoided by leg movement, adequate hydration and early ambulation. Thrombosis is often heralded by a flock of pyrexia or tenderness in the calf. If treatment had been possible in this case it would have been complicated by the problem of giving anticoagulants shortly after operation in a patient with a pyelic ulcer almost certain to lead to some bleeding, possibly massive. Efforts to support the circulation were made in this case, namely oxygen, amrinone, and verapamil with epinephrine to dilate the pulmonary vessels. Pulmonary embolectomy is occasionally successful but rarely practicable.
Case No. 2 - Leiomyosarcoma of the terminal ileum

Miss Mary Ross, aged 61
57 East Drive, Ronniee

Dr. Levan, 92 John Street, Ronniee

Occupation: Paper mill worker
Admitted: 20/2/61

Complaint: Abdominal pain for 4 days

History:

Four days ago Miss Ross first noticed a steady aching pain in her abdomen, at first generalized and later settling in the right iliac fossa. The pain was fairly abrupt in onset and is not much worse now than when it started. It did not radiate into the back or lower. It was associated with nausea and anorexia but no vomiting. She has never had a similar episode before. There has been no abdominal distension and the bowels have been functioning normally - although she always takes laxatives every other day. There has never been any blood in the stools and they have never been black. She has had no frequency, nocturia, dysuria or haematuria. Her appetite was good until 4 days ago and she has not lost weight recently. The menopause was at 43 and she has had no bleeding or discharge since. She had bronchitis last month and still has a slight cough with whitish sputum in the morning. She is slightly breathless on exertion but has no ankle oedema or chest pain.
Past History:
Jaundice as a girl, but never since then.
Pott's fracture of R. ankle 6 years ago.
No rheumatic fever, tuberculosis, diabetes or other serious illnesses and no operations.

Family and Social History:
The patient is a spinster living alone in a two-roomed house and working in one of the Penicuik paper mills. She does not smoke or drink. Her father and mother are both dead - her father had pneumonia and her mother died of "old age." One sister, aged 56, alive and well.

Examination:
Miss Ross is a healthy-looking, cheerful woman, looking younger than 61 though rather short. There is no jaundice or cyanosis and the mucus membranes are well injected. She is not breathless at rest & her temperature is 99°F.

Alimentary System:
The tongue is dry and slightly coated but there is no fetor.
The abdomen is smooth, well-covred & moves with respiration. There is no visible pulsation or distension. There is slight guarding and tenderness in the R.I.F. but no rebound tenderness. A rounded mass is palpable in the R.I.F., apparently rising out of the pelvis. It is not mobile, not attached to the anterior abdominal wall and dull to percussion. The liver, spleen and kidneys are impalpable and there is no lymphadenopathy.
The bladder was emptied by catheter but contained only 90 ml. residual urine. A rectal examination showed a palpable mass on the right, only slightly tender.
Cardiovascular system:
Pulse 100/min, regular in time & force, good volume
BP 120/100 mm. Hg
Jugular veins: pressure not raised; no ankle or sacral oedema.
Apoor beat in 5th intercostal space, within the mid-clavicular line. Two heart sounds in all areas
with no murmur.
Respiratory system:
chest symmetrical, trachea central, expansion good.
Percussion note resonant, breath sounds vesicular
with scattered rhonchi.
Breasts: No masses palpable, no nipple retraction
or discharge.
Central nervous system:
Cranial nerves intact except for left VIII
Motor and sensory pathways intact
Reflexes brisk and equal; plantar flexor.

Differential Diagnosis:
1. Appendix abscess
2. Uterine fibroid
3. Basalina of colonic
4. Schistosoma disease, tuberculosis, actinomycosis
5. Cerebral cyst or tumour

Investigations:
1. Haemoglobin: 81%
2. WCC: 16,300/cu. mm. Neutrophils: 87%
   Lymphocytes: 10%
   Monocytes: 2%
   Basophils: 1%
   Eosinophils: -
3. ESR: 49 mm./1st hour
4. Urine: no albumin, sugar, acetone, cells or cast
5. Blood urea nitrogen: 25 mg%.
6. Laparotomy on evening of admission:
   A lower right paramedian incision was used. A little peritoneal fluid was found.
   A large mass closely associated with the ilium 2 ft from the ilio-coccygeal valve was found.
   The tumour was adherent and dissected free, leaving a large fishy, mass 30 cm. across apparently attached by a pedicle to the small intestine. It was not possible to separate the mass completely so a 10 cm. segment of ileum was resected with it. There was no evidence of glandular involvement at the root of the mesentery and no other pathology was found in the abdomen. End-to-end anastomosis of the small intestine was carried out, the defect in the mesentery repaired & the wound closed in layers.

Pathology report:
A very vascular and partly necrotic leiomyosarcoma. The tumour was found to be highly cellular with inconspicuous mitotic activity, being made up of fusiform cells in interlacing strands around loosely arranged masses of polygonal cells. The nuclei were large, granular and had prominent nuclei.

Discussion:
The diagnostic problem in this case was the common one of a mass in the right iliac fossa. In very many such cases, even utilizing all the available clinical findings it is impossible to come to a firm conclusion before laparotomy. Thus, even laparotomy was inconclusive, and while it
excluded carcinoma of the cecum and appendiceal abscess it introduced further possibilities such as tumour of a Meckel's diverticulum, and it was left to the pathologist to provide the final answer.

The three main conditions considered in this differential diagnosis were appendiceal abscess, uterine fibroids and carcinoma of the cecum.

With a four day history and no previous episodes actual appendiceal abscess is unlikely, though in acute appendicitis an appendiceal mass of greater omentum and obliterates cecum and small intestines does form by the fourth day, but usually accompanied by more severe symptoms. Certainly, an inflammatory aetiology was likely with a pyrexia, tachycardia, raised ESR and polymorphonuclear leucocytosis, though malignant disease may also cause these.

Uterine fibroids are characteristically asymptomatic until infective or ulcerative processes occur or they reach a very large size. Thus, hydromics and cystic degeneration cause rapid increase in size and slight pain, infection and red degeneration cause more acute symptoms with signs of peritonitis, tension of the pelvis causes acute pain with vomiting and tenderness, and sarcoma tumour degeneration rapid increase in the size of the tumour with severe pain. Pressure symptoms from a large fibroid affect bladder, rectum, nerve trunks, blood vessels but no associated symptoms were present in this case. Fibroid tumours tend to regress, or at least stop enlarging after the menopause but no one can tell how long that mass had been present. Occasionally a subperitoneal fibroid may become so pedunculated
That it break off and wander free in the abdominal cavity - as can occur with a piece of omentum twisted from its source. Such a fibroid will later become adherent to another organ, usually intestine, and could very well have given rise to the picture in this case.

Lacrimaoma of the sacrum was also a possibility in this case. The most frequent mode of onset is insidious with anaemia and vague ill-health in a woman of this age group, and often the only finding is a mass in the right iliac fossa. Rarely, a papilliferous growth may form the apex of an intussusception, which it is characteristic by an inconstant lump associated with attacks of severe pain. Lacrimaoma of the sacrum is discussed more fully in later cases.

There are many other conditions causing a mass in the right iliac fossa, notably the inflammatory conditions affecting the terminal ileum such as leishman's disease, tuberculosis, and actinomycosis. Leishman's disease nearly always gives diarrhoea, at some stage which Miss Ross has never had. The condition goes on to acute or chronic intestinal obstruction and fistula formation. Tuberculosis of the intestines is now rare - many cases of so-called illocaecal hyperplastic tuberculosis are now thought to have been leishman's disease anyway. Diarrhoea again is the main symptom allied with loss of weight and cachexia, although subacute intestinal obstruction may occur in the late stage. Actinomycosis of the intestine is also rare, and only develops when a breach is made in the intestinal wall by other disease or trauma as after appendectomy.
Suppurative process and the disease spreads into the retroperitoneal tissues. Vague abdominal pain is common, and a hard, slightly tender mass is found in the R.I.F. Extensive of the disease to the psoas muscle sometimes fixes the hip in flexion. It is more common in the young than the elderly X-rays are of little or no help in diagnosis as lack of this three conditions usually shows a deformity in the sacrum.

Even rare causes of a R.I.F. mass include chronic amebic colitis - an amoeboma considered in someone having lived in the tropics - though even in this country 3% of the population are supposed to harbour Entamoeba histolytica. Chronic inflammation of a solitary congenital cecal diverticulum results in gross thickening of the ileocecal region. It is very uncommon to find colonic diverticulosis extending as far back as the sacrum. A tumour in a Michel's diverticulum is most unlikely, though cases have been reported, usually teratomatous in origin. A Michel's diverticulum is much more likely to cause melena, intussusception, volvulus, or perforation.

In a woman, gynaecological cause must not be forgotten. It retains involvement in usually in the midline, except for fibroids which have already been discussed. Various tumours and cysts, of which there are a very large number of types, might cause such a picture. These tumours may be benign or malignant and may or may not be associated with other symptoms. Some attain a very large size, especially the common pseudo...
mucinous cystadenoma. Malignant growths are common in postmenopausal women but become fixed while relatively small and usually accompanied by other symptoms of malignancy such as ascites. Labial swellings also enter the differential diagnosis but are usually bilateral and tender in inflammation while myoma is very rare. Conditions outside the abdominal cavity may give rise to confusion but are usually distinguishable on careful examination—for example, suppurating inguinal lymph glands or a femoral hernia ascending over the inguinal ligament. A palpable mass which can be indented by the finger is also distinguishable from a tumour, although it may be present as a result of myomatous obstruction.

Tumours of the small intestine are rare and come far down the list of differential diagnoses. Adenoma, submucous lipoma and leiomyoma are the commonest of the benign tumours and usually present as an intussusception or melena. Malignant tumours are very rare and account for less than 1% of all gastrointestinal malignancies. They occur mainly in the upper jejunum and lower ileum if carcinomas and more in the ileum if sarcomata. It has been suggested that factors such as alkalinity of the contents and absence of hold-up are important etiologically. All foodstuffs contain a certain amount of natural radioactive activity and the carcinogenic effect of this activity is most likely to be felt at sites where there is hold-up or transit is slow.

Sarcomata account for 40% of all malignant tumours—spindle-cell sarcoma or lymphosarcoma
are the commonest, but tend to present in the first few decades. With anaemia and loss of weight is an infiltrative rather than proliferative. 35% are carcinoma, which may cause intestinal obstruction, though anaemia is also a common symptom. leiomyosarcoma accounts for most of the remaining 25% and when metastases are present give the classical symptoms of cachexia, flushing, pulmonary stenosis, and bronchospasm due to serotonin production. leiomyosarcoma usually arises as a malignant change in the simple leiomyoma of plain muscle. This is much commoner in the uterus but also occurs in the alimentary tract, bladder & uterus. The leiomyosarcoma seldom gives rise to metastases & may not recur after removal, so it is of low grade malignancy, unlike the commoner lymphosarcoma. The prognosis in this case is therefore good, and local resection is likely to prove curative, whereas if it had been, say, carcinoma of the cancer, right hemicolectomy would have been necessary at the very least – the prognosis would have been much poorer. Miss Rice was looking the picture of health at a follow-up visit 3 months after operation. This case again presents the problem of insidious onset of malignancy with complete failure of prophylactic diagnosis. It is surprising that the tumour could have become so large with only a very short history of a vague nature and is proof of the fortunately low malignancy of the tumour. The rarity of the condition gives some cause for the failure in diagnosis, but the fact remains that modern methods are still hopelessly inadequate.
Case No. 3 - Neoplastic Intestinal Obstruction

Miss Joan Taylor, aged 71
96 Viewforth
Edinburgh

Admitted: 6/2/61

Complaints: Abdominal pain and constipation for 5 weeks becoming worse in the last 2 days.

History:
This old lady has been very constipated for the last five weeks but has continued to pass flatus per rectum. The stools have been hard and blackish in colour. She has always tended to be constipated but never as bad as this - she used to take laxatives about once a week. There has never been any blood in the stools.

Miss Taylor has also had a dull, growing, low abdominal pain, varying in intensity but never entirely absent, for the last five weeks. This pain does not radiate, is not related to food and is only slightly relieved by analgesics. She has lost her appetite & feels slightly nauseated, but has not vomited. She has lost 2 stones in weight in the last year. She has no cough but has been slightly breathless recently when climbing stairs. She had a similar episode 2 years ago, when an ECG was taken but gave a satisfactory result. She has no ankle oedema or chest pain. She has never been jaundiced. Micturition is normal with only occasional nocturia and no frequency, dysuria or haematuria. The menopause was at 54.
and she has had no bleeding or discharge since.

**Past History:**

1918 - appendectomy and "untwisting of a piece of bowel." No other operations. No rheumatic fever, tuberculosis or diabetes or any other serious illness.

**Family and Social History:**

Miss Taylor's father and mother died many years ago, of what she does not know. Her only sister died a year ago of heart disease and this was a great shock. She now lives alone in a bed-sitting room and is very lonely and unhappy. She is a non-smoker and a non-drinker.

**Examination:**

A very pleasant, rather thin, white-haired old lady with evidence of weight loss in rather dry, wrinkled skin. There is no jaundice or cyanosis and she is not breathless at rest. The mucous membranes are fairly well injected.

**Respiratory System:**

The tongue is moist, coated but there is no factor.

The abdomen is rounded with lax, wrinkled skin, moves on respiration, is not distended and shows no obvious peristalsis.

On palpation the abdomen is soft but tender, especially in the right iliac fossa and left hypochondrium, but without rebound tenderness. The descending colon feels full of faeces. The renal sinuses are intact. The liver, spleen and kidneys are impalpable and no abnormal masses are felt. There is no lymphadenopathy.

The bowel sounds are normal.

A rectal examination shows an empty rectum.
with no tenderness and no palpable masses except
for a rather hard, prominent cervix.

Cardiovascular system:
- Pulse 90/min., regular in time & force, good volume
- BP 160/95 mm. Hg

The apex beat is in the 5th intercostal space, on the
midclavicular line. Two heart sounds are heard in
all areas and there are no murmurs.
The jugular venous pressure is not raised & there is
no ankle or sacral edema.

Respiratory system:
The chest is symmetrical, the trachea central but
expansion is poor. The percussion note is resonant &
the breath sounds vesicular with no accompaniments.
There is no cervical or axillary lymphadenopathy
and no abnormalities in the breasts.

Central Nervous system:
The cranial nerves, motor and sensory pathways
are intact. The reflexes are fairly brisk and
equal and the plantar are flexor.

Differential Diagnosis:
Subacute intestinal obstruction due to
1. Inflamed feces
2. Carcinoma of the colon
3. Chronie diverticulitis
4. Adhesions

Investigations:
1. Hemoglobin: 80% 
   ESR: 42 mm/1st hour
   WCC: 7,600 / cu. mm.
2. Urine: no albumin, sugar, acetone, cells or casts.
3. Straight X-ray of the abdomen: slight
distension of the large bowel with a small bowel loop visible in the centre of the abdomen and no free air. "The appearances are not diagnostic."

4. Barium and water enema: no result.

5. Laparotomy on evening of admission: an ileal incision was made and revealed an abdomen distended with tumours. The primary was thought to be in the pelvic colon, but there were multiple secondary in the omentum, the pouch of Douglas and the liver. A node was taken for biopsy. As the obstruction was not complete, a colostomy was not performed, and the wound was closed in layers.


Further Progress:
Post-operatively there was a little abdominal distension which passed off in 2-3 days, and fairly constant pain, rated by Clamson.

24/2/61: Transferred to Buchmount. Peritoneal drainage was carried out and the pain seemed to lessen. It was kept at bay with Paracetamol, chloral and later Nyquil. She was given Petrolage and Sinchot for her constipation.

21/3/61: Died after gradual worsening of her condition.

Discussion:
The differential diagnosis of intestinal obstruction covers a wide variety of conditions. In acute cases there is often a more obvious cause, but in chronic cases especially in old people the differential...
between diverticulitis and carcinoma, the two most common causes, is often impossible pre-operatively.

In most cases the obstructing agent falls into one of four groups: firstly, intraluminal, where the lumen of the intestine becomes blocked by a foreign body or migrated faeces; secondly, intumbral - inflammatory or malignant structures, volvulus, and intussusception; thirdly, intramural, where the intestine is compressed from without by tumours, strands, bands and glands; and lastly, loss of propulsion, power, as in paralytic ileus, and mesenteric vascular exclusion. The main causes in the small intestine are tumours, adhesions and inflammatory fibrosis, while in the large intestine they are carcinoma, diverticulitis and volvulus.

The slowness of onset in this case excludes the major abdominal catastrophes such as strangulated hernia, mesenteric embolus and volvulus. However, in old people the body reactions are very much diminished, slowed, and even perforation of a peptic ulcer may present as subacute obstruction. Blood-loop obstruction is unlikely to be present here because antiperistalsis so raises the pressure within the caecum that the blood-vessels in the wall are compressed and there is, in effect, strangulation with all its more serious symptoms. In this case obstruction was not complete anyway but the presence of a distended loop of small intestine would suggest that the biocoid valve was permitting reflux, though this might have been due to the omental adhesions.

The site of the obstruction may be inferred from various signs and symptoms and
thus aid more accurate diagnosis. In the small intestine, colicky pain is an early feature, followed by sequential vomiting and later distension and constipation. In large intestine obstruction, constipation is an early feature, followed by distension, pain, and vomiting, usually in that order. Small intestine obstruction is usually centred with peristaltic remittent giving the characteristic "laddering pattern", while in large intestine obstruction it is peripheral. The pain in large intestine obstruction also tends to be more diffuse and ill-localised. The patient becomes seriously ill much quicker in the higher obstruction because of rapid dehydration. Miss Taylor's case thus fit the pattern of large intestine obstruction very well.

Apart from the possibility of incipient sepsis, there was very little clue as to the exact aetiology in this case. Haemorrhage occurs quite commonly in the elderly, especially if they are bedridden. Miss Taylor was living alone, much saddened by the loss of her sister and probably too apathetic to eat properly or take much exercise. The mass of hardened feces usually accumulates in the upper part of the rectum and enemas are often insufficient to dislodge it, when disimpaction under anaesthetic may be necessary.

Diverticulitis is a fairly common cause of intestinal obstruction in the elderly. It results from peridiverticulitis from longstanding disease or pericolic adhesions implicating the small intestine. The picture is unlike this case in that it is characterised by exacerbations and remissions of fluctuant oedema and constipation. Pain in the
left iliac fossa is usual, worse on defaecation or being jolted. This is also periodic diarrhoea with the passage of mucus and rectal haemorrhage occurs in 20% of cases. Tenderness in the left iliac fossa, a thickened tender pelvic colon are the main signs. X-rays show a straight area in the midst of a diverticula-bearing area, but may not be diagnostic.

Adhesions from this cause may also cause obstruction - postoperative fibrous adhesions may cause intestinal obstruction months or years after an abdominal operation. There is a definite individual predisposition to adhesion formation, but this would not constitute an important factor in differential diagnosis. A 3-year-old child after an operation, even though there was a suggestion in the history that there was adhesion or volvulus formation. Adhesions also occur from adhesion of loops of intestine to inflamed structures such as mesentric lymph nodes, as a complication of pelvic peritonitis and from chemical irritation by talc powder, salvarsan and penicillin.

Laxinina of the colon was fairly high on the list of differential diagnoses in this case but such a very extensive lesion was not suspected before operation. The growth may be annular, infiltrative, ulcerative or papilliferous - the first two being the most likely to cause obstruction. The most frequent site is the termination of the pelvic colon and the rectosigmoid junction, and here again the first two types are more common. In the right colon where ulcerative or proliferative types are more common the symptoms are mainly of bleeding giving an insidious onset with anaemia.
and hence having a poor prognosis. In the left
descending colon obstruction occurs with constipation, pain
and possibly peritonitis. Dilatation, and as these
symptoms are obvious early the prognosis is better.
Spread may occur locally or to
some distant organ by lymphatic or blood stream.
Direct implantation of cells across the peritoneal
cavity may also occur. This accounts for the
metastases found in the omentum, pouch of Douglas
and the liver. The hard swelling felt on rectal
examination may in fact have been such a
secondary in the pouch of Douglas & not the
rectum at all. Local spread with involvement of
nerve is responsible for much of the pain. The
lymphatic vessels draining the colon run in close
proximity to the arterial supply and it is for this
reason that high arterial ligation is required in
any curative operation. Blood-borne hepatic metastases
are sometimes solitary and resection may be of great
benefit to the patient. Pulmonary and cerebral
metastases may also occur from blood stream spread.
Luminal. Transectional implantation of the growth may
be responsible for ascites - absent in this case.
Diagnosis of carcinoma of the colon
is by sigmoidoscopy and radiography. The
sigmoidoscope visualizes the distal 30 cm. of the gut
and will diagnose tumour in the pelvic colon
which may be missed on X-ray. Barium enema
may show an irregular filling defect, but a
negative picture is not conclusive evidence of the
absence of a growth. A barium meal is
inadvisable as aspirated barium may precipitate
intestinal obstruction. A straight X-ray gives little
information even in widespread malignancy as shown.
in this case. Contrast enema may be more successful than barium enema.

Treatment in operable cases consists of widespread removal of the large intestine - from cecum to splenic flexure in a lesion of the right colon, and from splenic flexure to rectum in carcinoma of the left colon. Prognosis in distal lesions is relatively good, as high as 40-45% five-year survivals in early rectal carcinoma. Preparation of the bowel has made these resections and anastomoses much more practicable, though recurring purgation is now avoided. Preoperative treatment includes correction of anemia, a high-calorie, low-residue diet, 20% succinylsulphathiazole four-hourly for 5 days and 1G neomycin six-hourly for 2 days before operation. A suppository rather than abscess spread decides surgically as removal of the primary plus an infiltrated vein such as a loop of small intestine or the bladder gives quite good results.

The patient and doctor delay in this case was only 5 weeks, slightly less than average if anything; but it is doubtful if the prognosis would have been much better if the patient had been seen 5 weeks earlier. Carcinoma of the colon grows and spreads comparatively slowly so this growth must have been present for at least several months before operation. The rapid development after laparotomy and death within 2-3 months of diagnosis often occurs - it is often observed that any trauma, even an accident will somehow destroy the body's defenses and allow a previously slow-growing tumor to grow.
Postt neoplasms to break out and run wild.
Culletive colectomy, often performed in inoperable cases would not have prolonged life or increased comfort in this case so was just as well left undone - this is one of the few remaining indications for the Paul-Mikulicz operation.

Case No. 4 - Secstrial Pyloric Stenosis

Mrs. Agnes Reid, aged 59
50 Whitecraig Crescent, Bridge Street, Musselburgh.

Dr. Wilson, Musselburgh.

Occupation: Housewife
Transferred from Ward 30 17/4/61

Complaint: Persistent vomiting for 4 weeks.

History:
Mrs. Reid has suffered from fatigue and malaise, the exact nature of which is difficult to determine, in the last few years but has been otherwise well until a few weeks ago when she began to have attacks of vomiting after food. This has been worse in the last few days and she has been vomiting all her food shortly after taking it, except for water, milk and glucose drinks. She has not noticed any food which she took a long time before or any blood in the vomit. The vomiting is effortless and painless, not projectile and not
affected by posture. Her appetite is poor and she thinks she has lost weight but is not sure how much. She has had no abdominal pain and no jaundice. She finds it a great effort to think and remember the causes of her illness, feeling very tired and detached from her surroundings.

Personal history:

Micturition: normal; no frequency, nocturia, dysuria or haematuria.

Bowels: slight constipation but no melena

Sleep: very good

Cough: a slight cough in the last few weeks with whitish mucoid sputum but no blood.

No dyspepsia or chest pain, no headaches or dizziness, but her vision is sometimes ‘misty’. She dislikes cold weather & rarely feels warm enough.

Past history:

Pneumonia as a girl.

1953 - partial thyroidectomy for thyrotoxicosis

1959 - myxoedema - given 0.05 mg thyroxine daily to be taken indefinitely, but she stopped taking this after only a few months.

No rheumatic fever, tuberculosis or diabetes.

No other serious illness or operations.

Family and social history:

Her husband is a blacksmith and alive. She is their only married daughter.

She smokes a few cigarettes a day but does not drink.

Examination:

A thin, twisted but pleasant woman, continually licking her lips. She looks pale and pallid.
but the sclerae are not jaundiced. Her hair is thin and the outer thirds of her eyebrows are absent. Her voice is slightly husky and slow but there is no coarseness of skin or features and no suprascapular fat padding.

**Gastrointestinal System:**
The tongue is dry and furred. The breath very fetid.
The fauces appear slightly inflamed with one or two small necrotic ulcers. The skin of the abdomen is lax, wrinkled and dry. The abdomen moves on respiration and shows marked retoic pulsation. There is slight distension but no visible peristalsis.

On palpation there is no tenderness and no palpable masses and liver, spleen and kidneys are impalpable. No splashing was elicited.
The bowel sounds are normal and a rectal examination negative.

**Cardiovascular System:**
The mucous are well injected and there is no cyanosis ankle or sacral exema.
The pulse is 66 bpm, regular in time and force, good volume and normal wave pattern.
BP 110/60 mm. Hg

The apex beat is in the 5th intercostal space within the midclavicular line. Two heart sounds are heard in all areas, the first sound in the mitral area being accentuated. There are no murmurs.
The jugular venous pressure is not raised.

**Respiratory System:**
The patient has a short, deep, frequent cough but no sputum.
The chest is symmetrical, the trachea central, and
expansion is moderately good.

The percussion note is resonant except at the \( R \) apex.

The breath sounds are vesicular, louder on the left.

and thus is an occasional rhonchus and some
fine crepitations at the \( R \) apex.

Central Nervous System:

The \( R \) pupil is slightly larger than the \( L \) but both
are central, symmetrical & react briskly to light &
accommodation.

The cranial nerves, motor and sensory pathways are intact.

The reflexes are present - symmetrical, the plantar reflex

Differential Diagnosis:

1. Pyloric stenosis due to neoplasia
2. Pyloric stenosis due to peptic ulceration
3. Hirschsprung's
4. Chronic duodenal ulcer
5. Ectopic gastric mucosa

Investigations:

1. Hemoglobin: 95 \% on 5/4/61
   74 \% on 20/4/61
2. ESR: 2 mm/1st hour
   WCC: 7,600/cu.mm.
3. Urine: sugar +
   no albumin, acetone
   a few epithelial cells & hyaline casts
   but no red cells.
4. Postprandial blood sugar: 108 mg%.
5. Faecal occult blood: repeatedly - ve
7. Chest X-ray: - ve
8. Blood urea nitrogen: 27 mg% on 18/4/61
   10 mg% on 20/4/61
9. Acid content of vomit 120 mg/l on 13/4/61.

10. Serum electrolytes (mg/l):

<table>
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<tr>
<th>Date</th>
<th>Na+</th>
<th>K+</th>
<th>Cl-</th>
<th>CO₂ combining power</th>
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<td>3.6</td>
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11. Barium meal 14/4/61:

This revealed a lot of food residue and deformity of the pyloric antrum with an ulcer crater. The degree of deformity, the apparent distortion of mucosal folds, and the marked narrowing were all thought to be in favour of a neoplastic process, probably carcinoma.

12. Laparotomy 21/4/61:

An upper midline incision was made. Ulcers, duodenal scarring were found anteriorly with thickening of the pyloric antrum. A small firm gland was found above the first part of the duodenum. There was no obvious evidence of neoplasm, no secondaries in peritoneum or liver. The rest of the abdomen appeared normal, so a partial gastrectomy was performed. A two-third Polya gastrectomy with a Hofmuister valve and an anterobic anastomosis was used, leaving a 3-finger stoma. A stab drain was inserted through a flank incision to the duodenal stump.

13. Pathological report:

Two small chronic ulcers were found in the first part of the duodenum, and fibrosis in the wall had led to pyloric stenosis. In the floor of one of the ulcers was a small cystic nodule.
containing duodenal mucus - probably a duodenal fistula pulled down by the fibrosis. A diagnosis of non-neoplastic gastric pyloric stenosis was therefore made.

Further Progress:
21/4/61: Hourly aspiration with a Ryle's tube with no oral fluids but an intravenous drip giving 3 litres of fluid in the 24 hours - two bottles of saline + one of dextrose with 3 Cts of KCl in the drip in the 24 hours.
22/4/61: Two - hourly aspiration. 3 pints packed cells as well as glucose saline.
23/4/61: Bowel sounds good, oral fluids started.
2/5/61: Discharged for convalescence to Buchmount.
4/5/61: Readmitted with the diagnosis of slough, venous thrombosis of the right leg. On examination there was no tenderness in the calf, no distension of the superficial veins and no pulses so the patient was given a firm bandage + mobile.
8/5/61: Discharged, very well.

Discussion:

The history and symptoms in this case were not typical of pyloric stenosis. In cervical stenosis there is usually a long history of periodic dysphagia and hungry pain. Vomiting is rare in an uncomplicated duodenal ulcer but as the stenosis develops accuess with increasing frequency and in increasing amount. Neoplastic stenosis may not have proximal symptoms but when it occurs, like cervical...
Stenosis usually gives characteristic profuse, foul and frothy vomiting, commonly once every evening. Classically the patient recognizes partly digested food eaten hours or even days previously. Often this is gastric distension and splashing relieved by the vomiting. Vomiting just after meals is thus not characteristic and brings to mind such things as achalasia of the esophagus and hiatus hernia which however do not fit in with the rest of the history and were ruled out by the barium meal.

Pyloric stenosis is usually the result of erosion from a duodenal ulcer, and so should really be called duodenal stenosis. Occasionally fibrotic stenosis follows a peptic ulcer. Symptoms may also be produced by inflammation of such an ulcer with indurated narrowing from cicatrices and spasm in the presence of an already narrowed lumen but then one would expect epigastric pain and other symptoms of an inflammation. Not infrequently stenosis is due to carcinoma at or near the pylorus and it was the suspicion of this that caused Mrs. Reid's transfer to a surgical ward. Neoplasia was suggested by the absence of previous peptic ulcer history and the barium meal findings, together with the loss of weight and constitutional symptoms. Points against neoplasia were the very high acid content of the vomit and the low ESR. Gastric carcinoma almost never exists in a stomach secreting a lot of acid as has already been discussed. The very high total acidity found here would be partly due to fermentation, partly to union of free acid with food debris and mucus and...
partly to the high acid output itself.

X-ray examination of the stomach is still the best single means of detecting gastric carcinoma and a skilled radiologist shows a high degree of accuracy in interpretation of a barium meal, though small lesions are apt to escape notice, especially if too much barium is given initially. Lesions of cardia and fundus may be missed unless the patient is tilted head-down. Flat growths may be difficult to see or may be attributed to gastritis. Radiodiagnosis is accurate in 90% of pyloric growths, 75% of cardiac and 60% of body growths. Obviously too frequent diagnosis of malignancy is preferable to labelling too many cases as gastritis or benign ulceration, though in only 47% of patients with conclusive radiological findings is the neoplasm found to be resectable.

Gastroscopy undertaken by an expert gives the highest percentage of correct preoperative diagnosis. With the inception of the area shown in the diagram, the whole of the interior of the stomach can be visualised. Certain indications to the passage of a gastroscope are inflammatory lesions of mouth and pharynx, lesions of the oesophagus, gastric aneurysm and chronic "blind" areas of jejunal deformity. Especially dorsal the stomach hypertrophy in old people and cervical osteoarthritis. The procedure is also more difficult in patients with all their own teeth. It is most useful in diagnosis of shallow gastric ulcers that do not show on X-ray, in checking results of medical treatment, in differential diagnosis between a chronic peptic ulcer and a carcinoma.
as here, in diagnosing a small gastric neoplasm, in detecting certain forms of gastritis, and for the direct examination of the stomach in cases of suspected gastrointestinal ulcer. The main danger of gastroscopy is perforation of the esophagus. Biopsy of the stomach is now being performed with increasing frequency, either blindly or under visual control through a gastroscope. Bleeding from such a biopsy is usually slight and soon stops, but occasionally is more marked and may need to be treated as a hematoma. Gastroscopy is performed under local anesthesia, and fatalities have occurred from reaction to the local anesthetic, so not more than 2 ml of 2% xylocaine is used as a local surface anesthetic.

Teflon cytology might also have been helpful in a case such as this, although the process is still in the developmental stage and as yet confirms carcinoma of the stomach in only three out of five cases where a growth is present. Negative results are therefore of no importance. Submucosal saline to soften the mucous lining may help (van de Rijn 1956). An abrasive balloon which can be rapidly inflated or deflated, or a brush to detach cells from the malignant area have also been used.

The main differential diagnosis in this case was between peptic and neoplastic pyloric stenosis, and was only made on laparotomy. Other less likely and rarer causes include hypertrophic pyloric stenosis in adults, a gall-stone involving the duodenum, and the delayed effects of corrosive or ferrous-sulphate poisoning. Symptom like pyloric stenosis may be produced by the rare
condition of chronic duodenal ilus in which the duodenum is found to be widely dilated up to the point of crossing of the superior mesenteric artery. Prolapsing gastric mucosa is questioned as an entity. But reports of cases of cases occurring in many parts of the world continue to be published. Hypertrophied gastric mucosa is said to prolapse through the pylorus causing partial obstruction. Adenomatous polyps of the stomach, usually present with bloating and abdominal pain, but very rarely a pedunculated polyp may be carried into the pyloric canal and cause obstruction. These polyps are probably premalignant and so partial gastrectomy is performed. The finding of a duodenal diverticulum, as in this case, is usually incidental and in no way the cause of obstruction. Syphilis of the stomach produces thickening of the wall and mucosal ulceration with symptoms and signs like a peptic ulcer or a carcinoma. Tuberculosis of the stomach is very rare.

The only other point for consideration among all these diagnostic canaries is the possibility of ketosis, possibly diabetic, as a cause of vomiting. The urine in this case showed some sugar but no acetone but ketosis is most unlikely to persist for 4 weeks without much more serious effects. Intense thirst and air hunger were absent as were symptoms of previously neglected diabetes. Glycosuria occurs in hypothyroidism because of excessive glycoaenolisis. But this patient has gone from being hyper- to hypo-thyroid and a lowered renal threshold is the most likely explanation.
The associated myoccardia in this case may have been at least partly responsible for the atypical history by masking acute symptoms and superimposing anemia, tiredness, and weakness which are more typical of malignancy. When myocardia and malignancy are coincident diagnosis may be very difficult, especially as one gets the clinical impression that malignancy in a patient with myocardia is less violent and progresses more slowly than when the thyroid is normally engaged in "stoking the metabolic fire." Myocardia may cause anemia as may peptic ulceration and malignancy, though the anemia tends to be macrocytic in nature. No blood film was examined in this case. It is interesting to note how dehydration masked anemia in this case—hydration causing a fall in hemoglobin from 95% to 74%, only some of this fall being accounted for by minimal gastric-intestinal hemorrhage. Association of anemia in a myocardia patient requires care because of the likelihood of atheroma and a flabby myocardia — accordingly packed cells were given slowly with attention to the neck veins for signs of overloading of the circulation.

The rather odd mental state of the patient may have been partly due to her hypothyroidism—slowness, apathy, and dimness being common in myocardia—but it may also have been contributed to by the prolonged vomiting with its consequent vitamin B deficiency and alkalosis. The patient became much less sleepy and vague once an attempt was made to correct electrolyte or acid-base balance.

Management in this case, in fact,
mainly consisted in adjusting electrolyte and acid/base balance upset by the prolonged vomiting. The vomit in this case was shown to have a very high acid content, typical of pyloric stenosis. This alkalosis was further complicated by dehydration due to water loss and ketosis from excessive mobilization of body fat consequent upon poor food intake. This is shown by the high CO₂ combining power of 37 meq./l (normal 26-32 meq./l) which was reduced postoperatively to 29 meq./l. Albumin depletion was in evidence too—a preoperative serum level of 39 meq./l rising later to 98 meq./l—the normal being 97-106 meq./l.

Dehydration by lowering the renal circulation caused a degree of intravascular ushemia, with a blood urea nitrogen rising to 27 mg % from a normal level of 14 mg %. Changes in sodium and potassium occurred too, especially the latter which fell to a level of 2.5 meq./l in contrast to a normal level of 3.5-5.5 meq./l. Na⁺ loss is increased in alkalosis because of increased reabsorption of bicarbonate and conservation of H⁺ ions by the kidney. This loss of Na⁺ increases the loss of K⁺ which, as it is an intracellular ion, has much more serious effects. Loss of K⁺ is also very difficult to replace satisfactorily on oral or intravenous therapy and to raise the serum levels without affecting intracellular concentration with possibly disastrous effects on the heart. Giving 30 mEq KCl per day intravenously was enough to bring the potassium levels back to normal three days after operation though this does not
necessarily mean that the intracellular concentration was thin normal. Sodium depletion was not corrected so rapidly and in fact the levels fell when oral fluids were instituted. However, this is not nearly so dangerous as the other effects and would probably right itself with increasing activity and more normal food and fluid intake. Replacement of deficits of sodium, water and potassium can be achieved by giving so-called "gastric solution" which contains:

\[
\begin{align*}
10 \text{ mg} & \quad \text{NH}_4 \text{Cl} / \text{l} \quad (\text{as a source of H}^+) \\
63 \text{ mg} & \quad \text{NaCl} / \text{l} \\
17 \text{ mg} & \quad \text{KCl} / \text{l}
\end{align*}
\]

This also corrects acid/base imbalance and the amounts are guided by the serum bicarbonate. Later management of this patient would include notification of her thyroid state with proper assessment and persuasion that taking thyrroxin would be really worthwhile.

Two days after discharge, Mrs. Reid was readmitted with a suspected deep venous thrombosis. Fortunately, the symptoms did not warrant such a diagnosis and a firm bandage was all that was necessary, but if the diagnosis had been correct the problem of management would have been difficult so soon after a major abdominal operation. Most cases of deep venous thrombosis occur about 7 to 10 days after operation but in the first case discussed here there was a fatal pulmonary embolism presumably from a silent thromboi on the 15th postoperative day so the 14th day as in this case is not too late for such an episode to occur. Anticoagulant therapy which is the usual treatment in thromboi of the leg veins might have been dangerous here because of the recent
partial gastrectomy with the possibility of bleeding from the operation area. However, the actual risk of bleeding having been removed and a stomach having emptied after the operation anticoagulant therapy with all possible precautions would probably have been safe enough. Some authorities consider it safe to give anticoagulants as early as six hours after operation. A very careful watch on the prothrombin time would be necessary, with daily estimations. Knowing the patient's blood group would make cross-matching easier and blood available more rapidly. At the slightest sign of bleeding from any site or surface the drugs should be stopped - this is often a slight warming epistaxis before a more serious hemorrhage. The appropriate anticoagulant should be given - 10 ml. of 1% protamine sulfate for heparin - 10 mg. vitamin K₁ for phenindione - both intravenously. Anticoagulant therapy is usually continued for 7-10 days in venous thrombosis when danger of a pulmonary embolus is thought to be over.

The remaining points for consideration relate to the operative treatment of the case. If this had been no question of malignancy Mrs. Reid would have made a good candidate for gastro-giunostomy and vagotomy. This operation carries a very low mortality and gives good results in selected cases. It is best in cases of duodenal ulcer in patients over 45 with a relatively low acid output, for gastric pyloric stenosis and in women, who are not prone to the development of an anastomotic ulcer but who are very susceptible to post-gastrectomy syndrome. The only complication of such an operation is diarrhoea and this is usually not serious. The 72 risk of
stomal ulcer is further reduced by the vagotomy and less in any case is remediable by subsequent partial high gastrectomy. More serious but much more complications are jejunal ulcer, gastric - jejuno - colic fistula and jejuno - gastric intussusception.

The Polya gastrectomy used in this series is used in most cases of duodenal ulcers of long-standing and also for dual gastric and duodenal ulcers. The Billroth II resection gastrectomy is used only for gastric ulcers. The Heineichen valve prevents too rapid emptying of the stomach and entry of stomach contents into the blind effluent loop. The operation described by Polya was retrocolic but the antecolic version is often used as it lessens the likelihood of kinking of the effluent loop by a looped transverse colon. Early complications of a partial gastrectomy, apart from the general ones of shock, venous thrombosis, infection, hypotension, inhalation pneumonia, are bleeding from the antrum - shown by blood in the gastric aspirate, stomal hold-up from peristalsis by peptic ulcer, and acute pancreatitis may also occur.

If more importance in the average case are more remote complications - the postgastrectomy syndrome. After gastrectomy, most patients have a certain amount of postprandial discomfort - a sense of fulness which may take up to 2 years to disappear - in about 52% of patients, especially women, this is more serious and the dumping syndrome occurs. This dumping syndrome may be with or without bilious vomiting - in the form of bile and pancreatic juice collected in the effluent loop or
vomited after food has passed into the effluent loop. In the young, without bilious vomiting, the bile follows the food into the effluent loop rapidly and there is tachycardia, sweating and profound lassitude which may be so severe that the patient dies to his deam. Intestinal hurry may cause diarrhoea, straining and abdominal pain. Relief is usually given by propanthine or similar drugs but may necessitate conversion to a Roux-en-Y gastrectomy or vagotomy. General effects of such a syndrome are loss of weight, meconia or even macrocytic anaemia and vitamin B deficiency. Bilious vomiting occurs exclusively after a Polya gastrectomy but the second type also occurs after Billroth I gastrectomy and a possible explanation is that concentrated food of high osmotic properties passing rapidly into the jejunum causes such an outpouring of intestinal secretions that a severe loss of fluid and electrolytes, especially potassium, occurs from the circulation into the alimentary canal causing the above symptoms.

The dumping syndrome is known as the early postgastrectomy syndrome. Late postgastrectomy syndrome or postprandial hypoglycaemia is much less common, more easily remedied. Rapid absorption of glucose stimulates overproduction of insulin causing attacks of hypoglycaemia 2-3 hours after meals. These attacks last 30-40 minutes and consist of giddiness, tremor, nausea and a feeling of impotence in the epigastrium. They are aggravated by exercise but easily prevented by sucking glucose sweets frequently between meals.
Lase No. 5 - Haecal Fistula

John Mackie, aged 49
31 House o' Hill Road,
Edinburgh

Dr. Watt,
Inverleith Row,
Edinburgh

Occupation: Teacher
Admitted: 30/1/61
Examined: 18/2/61

Chief Complaint:
Abdominal pain for 7 days prior to admission
Nausea & anorexia for 3 days on 30/1/61

Past History:
Ten days prior to his admission to hospital, Mr. Mackie had a vague influenza-like illness lasting 2-3 days, and on recovery he noticed a constant dull, aching pain just below his umbilicus. 3 days later this pain moved to the right iliac fossa, and had been getting worse, spreading up into the right flank but not into the back or anywhere else. For the 3 days prior to admission there had been associated nausea and loss of appetite but no vomiting. He has had a "grumbling appendix" for many years but had never had such as severe episode of pain before. He occasionally gets heartburn - a retrosternal burning sensation - and waterbrash, but this is only a slight discomfort. His bowels are usually regular but he had diarrhoea on the day before admission and has had bouts of it since. The motion has never been black or contaminated blood.

He was operated on on the night of
admission but told that the surgeons were unable to take his appendix out and left with a drain in. He became iller and a fortnight later had an abscess opened in his wound. Instead of improving, the wound started discharging fluid fecal matter and this has continued. Mr. Mackie has been given 3 pints of blood.

Personal history:
- Micturition: normal – no frequency, nocturia, dysuria, or haematuria.
- Appetite: usually good but poor since a few days before admission.
- Weight: steady before admission but now falling.
- No cough, sputum, dyspnoea or ankle swelling.

Past history:
- No rheumatic fever, diathesis, tuberculosis, or diabetes.
- No other serious illnesses or operations.

Family and social history:
Mr. Mackie is married with 2 children. His wife, family and all alive and well. His father died of a heart attack but his mother is still well. He has one brother who is also well. Mr. Mackie smoked 15 cigarettes a day until 3 days before admission but has since stopped altogether. He is a moderate drinker.

Examination:
- A very pleasant but anxious-looking man, well built but not obese with no signs of recent weight loss. Mucous membranes are well injected and there is no cyanosis or jaundice.

Alimentary system:
- The tongue is moist and furry, there is some festuca.
- The abdomen moves with respiration. A dressing in
The right iliac fossa course an open wound with serous-brown fume emerging from it. The surrounding skin is covered by aluminium paste but this is still considerable exsanguination.

There is tenderness in the right iliac fossa but no palpable mass though palpation is rather difficult. The liver, spleen and kidneys are not palpable. The distal reflexes are intact and the bowel sounds normal.

A rectal examination was not performed but was previously reported as showing tenderness on the right anterior.

Cardiovascular system:

Pulse 88/min., regular in time and force, good volume.
BP 120/70 mm Hg; regular venous pressure not raised.
The apex beat is palpable. Two heart sounds are heard in all areas with no murmur.
No ankle or caecal occlusion.

Respiratory system:
The anteroposterior diameter of the chest is increased but expansion is moderately good. The trachea is central.
The percussion note is resonant and the breath sounds vesicular with occasional rhonchi.

Central nervous system:
Sensory moves, motor and sensory pathways intact.
Reflexes brisk and equal. Plantar flexor.

Differential Diagnosis:
1. Unresolved appendicular abscess
2. Carcinoma of caecum
3. Carcinoma of appendix
4. Ileo-caecal actinomycosis
Investigations:

1. Blood investigations:
   - Hemoglobin: 78% (92)
   - ESR: 63 (mm/1st hr)
   - WCC: 14,500
   - Date: 30/1/61
   - Date: 6/2/61
   - Date: 15/2/61
   - Date: 20/2/61

2. Urine: No albumin, sugar, acetone, cells or casts.

3. Drainage of abscess - 30/1/61:
   A right groin incision was made and revealed a large, hard retroperitoneal mass, involving the pelvic pereitonum which released free pus on being broken down. The cancer was mobilized but the abscess could not be removed, so a rubber tube drain was put in and the wound closed in layers.

4. Respiration - 14/2/61:
   The abscess was again opened owing to continued discharge and pyrexia.

5. Bacteriology of retroperitoneal mass showed a penicillin-resistant staphylococcus aureus.

FURTHER PROGRESS:

The fecal fistula continued to discharge but the contents became more solid. It was treated by potassium supplements, sedatives to harden the intestinal contents and daily baths. A course of chloramphenicol cured the staphylococcal infection. Three more units of packing cells raised the hemoglobin to 95% and the ESR fell to 25 mm/1st hour. A barium enema was unsuccessful but a barium meal was done on 6/3/61. This showed that the lower pole of the cancer was confluent with the abscess cavity and fistula, but no abscess was outlined. No definite filling defect was seen but the warning was given that...
The appearance did not exclude malignancy in the carcinoma.

The patient was discharged for convalescence on 14/3/61, but readmitted one month later because the fistula still had not closed. It was still discharging fluid feces - yellowish-brown in the morning but later black as iron tablets were taken during the day. The discharge was so profuse that changeings had to be changed five times a day. Solid black feces were being passed per rectum - usually once or twice a day. The patient was very tired of the whole business but his appetite had improved and he had gained 4 lbs. in weight. He still had some pain and tenderness in the right iliac fossa, and on examination the bowel mucosa could be seen protruding through a gaping wound in the incised skin. Serum electrolytes were found to be normal:

\[
\begin{align*}
K^+ & = 4.5 \text{ meq./l} \\
Na^+ & = 140 \text{ meq./l} \\
Cl^- & = 105 \text{ meq./l}
\end{align*}
\]

The fecal fistula was closed on 13/4/61.

At operation the carcinoma was found to be exposed and adherent to the abdominal wall. The skin and muscle layers were dissected free, the carcinoma mobilized, and the peritoneum between the two excised. The cavity was closed. The small intestine was found to be free of adhesions and the wound was closed in layers.

Apart from some postoperative hypotension which necessitated 2 pints of blood, recovery was uneventful, and when last seen on 9/5/61 the patient was very well.

Discussion:

An external fistula communicating with the rectum sometimes does follow the opening of an
appendiceal abscess but assures suspicion of some superimposed pathology, especially malignancy when the fistula does not close spontaneously. Fistulas may occur after operation for gangrenous appendicitis or strangulated hernia, from a leak after intestinal anastomosis or in opening an abscess connected with chronic diverticulitis. Extensive fistulas may form on operative intervention in a case of Crohn's disease or tuberculous disease of the peritoneum or intestines. Colostomy avoidance has already been mentioned in the differential diagnosis of a right iliac fossa mass - it may cause multiple indurated discharging sinuses and fistulas with purulent containing sulphur granules. All these causes except malignancy can be virtually excluded by the short, not very acute history, the absence of prolonged diarrhea before operation, the generally good state of health of the patient. Great interest was aroused by the possibility of malignancy in this case because, probably by sheer coincidence, there had been no fewer than three cases of carcinoma of the appendix on this unit in the last two or three years. That this was just coincidence is shown by the fact that less than 120 cases of carcinoma of the appendix have been reported in British literature since Masson differentiated the condition from carcinoid tumors in 1928. Of all appendicectomies, 1 in 200 is a carcinoid tumor and only one in 1700 an actual carcinoma. Three types of carcinoma have been described - a mucinous, adenocarcinoma, the colon type of carcinoma and a malignant mucocele. 10% of all appendiceal mucoceles are found to be malignant.
but are only fatal if they rupture and cause pseudomyxoma peritonei, symptomatic spread in rare. So far the diagnosis has never been made pre-operatively as the condition presents as the common picture of a filling defect (Stiehl's definition). This is a palpable mass in the right iliac fossa, much more likely to be due to carcinoma of the cecum or incarcerated tuberculous ulcers have been made that a mucocele can be diagnosed on barium enema by the appearance of a smooth filling defect displacing the cecum with "calcium flecks" at the periphery of the defect. The prognosis in carcinoma of the appendix is relatively good as the small lumen causes early obstructive symptoms although infection and perforation with early spread might also be likely. Right hemicolectomy is the treatment of choice in several apparent cases of the condition.

Carcinoma of the cecum is a much more common form of malignancy. This can present with anemia or a mass in the right iliac fossa or with the symptoms of appendicitis. On rare occasions the appendix is inflamed or even gangrenous from obstruction to the mouth of the lumen by carcinoma. Mr. Mackie's hemoglobin was only 78% on admission — low for a healthy men of 49 with no obvious source of blood loss — and this coupled with the loss of weight and persisting fistula was the foundation for the suspicion of malignancy. Treatment of a fecal fistula depends on at least partly on its site. The site of the leak and the length of the fistula can be determined by barium meal or barium enema so
in this case. The higher the fistula in the alimentary tract the more pronounced are the effects both as regards excretion of the skin and loss of water, electrolytes, and protein. Maximum damage is caused by a transmural fistula which is bile-stained or contains undigested food rather than fecal matter, and some form of suction apparatus is required to remove the enzymeladen discharge from the skin surface, while fluid and electrolyte replacement continues intravenously.

Treatment of a fecal fistula as in this case consists mainly of measures to cut down skin irritation and promote healing. Known saline can be given daily in a dose of 0.3 G orally to make the intestinal contents less irritating to the skin. Phenyldiphenazone reduces the bacterial content of the discharge and controls concomitant wound infection. Iodine or similar solutions help by thickening the discharge and protection of the skin. by aluminium paste is important. Attention to fluid and electrolyte balance has already been mentioned. Potassium replacement is especially important, as in cases of prolonged diarrhoea from any cause the hazards of such replacement have been discussed in the previous case. Blood transfusion helps to correct any anaemia or also hypoproteinaemia. Closure of the fistula may be attempted with a rubber or metal obturator or operative treatment may be required as in this case. The original appendicitis in this case was an acute attack on a basis of recurrent subacute appendicitis – the very common 'grumbling appendicitis'. This is one of the commonest forms of
appendicitis and if very careful histories are taken from patients presenting with acute appendicitis, over two-thirds are found to have had previous milder but similar attacks of pain. The existence of chronic appendicitis as an entity has been questioned and most cases diagnosed as this are really the recurrent form, but this is an uncommon condition of chronic obliterative appendicitis which is, however, symptomless per se but associated with hypochlohydria and pylorospasm or colonic spasm. The appendix is found to be fibrous and its lumen obliterated, especially distally, and it is thought to be due to an impoverished blood supply from sclerosis of the appendicular artery. Diverticula and interseption of the appendix are rare.

The differential diagnosis of acute appendicitis is very wide, including a slow leak from a psittic ulcer with fluid travelling down the right paracolic gutter and pneumonia with referred pain from diaphragmatic irritation. Mr. Massie did have some history of heartburn and watchfulness that could have been due to an ulcer and also a vague influenza-like illness just before admission that could have resulted in a pneumonia but both these possibilities were refuted by the finding of an appendicular mass. In a woman all sorts of gynecological conditions would have had to have been considered, including ovarian cyst, acute salpingitis, degeneration in a fibroid and even ruputiated ectopic gestation. If diarrhoea had been a preoperative rather than a postoperative symptom, acute regional ileitis would have been a possibility. Cholecystitis, right ureteric colic, acute pyelonephritis, acute renal vesiculitis and osteomyelitis of the ilium.
an also capable of giving a picture like acute appendicitis. Abdominal cramps, constipation or tenderness and pre-peritoneal pain of the right tenth and eleventh thoracic nerves can also mimic the pain of appendicitis. All these conditions can usually be excluded by an accurate history and examination.

In this case the onset was so very acute, and by the time the patient was seen an appendiceal mass had formed. An actual abscess does not usually form till the fifth to tenth day, though in Mr. Mackie's case an abscess had already formed by the time of admission. Accompanying an abscess there is a variable pyrexia, but the pulse rate is usually under 100-88 in this instance. There was also the typical polymorphonuclear leucocytosis and the raised E.S.R. When diagnosis has been delayed for three or four days and an appendiceal mass has formed opinions differ as to the best form of treatment. Some advocate removal of the appendix even when a palpable lump is present while others prefer the delayed克莱恩-谢尔恩 regime when the patient is maintained with intravenous fluids, antibiotics, local heat and a watch on pulse and temperature until resolution occurs. This works in about 90% of properly selected cases - the appendix is slowly removed 3 months after the acute stage has abated. Indications for resection include the presence of pus, fixed adhesions, an abscess or a frank perforation. A doubtful diagnosis precludes a wait for resolution of a peritonitis and patients under 6 and over 65-in whom peritonitis is likely. A rising pulse rate, vomiting, pain and diarrhea or the passage of mucus are indications for resorting to operation. In Mr. Mackie's case an abscess had already formed so conservative treatment could not have been carried out.
Case No. 6 - Tuberculosis of
the Descending Colon

Mr. Thomas Christie, aged 33  
11 Caltonian Road,  
Edinburgh

Dr. Shepherd,  
Ugargos Path,  
Edinburgh

Occupation: Salesman  
Admission: 15/2/61

Complaints:
Passage of blood per rectum for 3 months  
Constipation for 1 month  
Loss of appetite for 1 month

History:
Mr. Christie has been in good health until 3 months ago when he noticed dark red blood in his stools. There was never a lot of blood and it did not appear except on palpation, but it was present nearly every day. There was no associated pain or tenesmus and no feeling of prolapsed piles. After two months he consulted his doctor who treated him for piles with suppositories and enemata. Since then bleeding has only occurred once or twice, but there has been a yellowish shine in the stools for the last month. He has been constipated for the last month, in spite of taking laxatives, which is most unusual for him. The stools have occasionally been dark in colour recently. There has been no nausea or vomiting and no indigestion or abdominal pain except slight "colic" shortly after taking laxatives. The last month Mr. Christie's appetite has been poor and he has been generally off-colour.
He thinks he has lost weight recently. He has not been jaundiced or noticed any abdominal distension. He has a slight cough with a little whitish sputum, but has never had hemoptysis. He is not breathless on exertion and has no chest pain. Micturition is normal with no frequency, nocturia, dysuria or haematuria.

Past history:
No rheumatic fever, tuberculosis, diabetes, or other serious illnesses. tonsillectomy as a child, but no other operations. Mr. Khristi has suffered from asthma for many years and has been told this has a nervous basis.

Family and social history:
Mr. Khristi is married but with no family. His wife is alive and well. His mother died of a "stroke" but his father is alive and well. The patient was off work for a year with asthma and was rehabilitated as a painter but gave this up to become a paint salesman. He likes this job and is now free from trouble by asthma although he had a bad attack 2 years ago when he was very upset at his mother's death. He does not smoke and drinks only rarely.

Examination:
A thin, nervous young man, wheezing slightly with a maculopapular rash on face, arms and trunk and some petechiae on the back. No cyanosis or jaundice. Mucous membranes well injected.

Examination System:
Tongue moist and clean, no fetor.
The abdomen is smooth and moves on respiration. It looks slightly distended but evidently this is normal. There is no obvious peristalsis. There is a magenta-coloured rash on the pubic area.

On palpation there is no tenderness and no abnormal masses. The liver, spleen and kidneys are palpable and the renal orifices intact. They are shrunken, enlarged, non-tender lymph nodes in both groins. bowel sounds are normal.

A rectal examination showed a nodular mass round the anus and a skin tag posteriorly. There was no tenderness and no palpable masses. The prostate was normal.

Cardiovascular system:

- Pulse 100/100 mm Hg, regular in time and force, good volume
- BP 120/70 mm Hg
- The apex beat is in the 4th interspace within the midsacral line. There are 2 heart sounds in all areas and no murmur.
- There is no ankle or sacral edema.

Respiratory system:

- Chest symmetrical, trachea central, expansion good
- The respiration is not fast or laboured but wheezing
- The percussion note is hyper-resonant and the breath sounds vesicular with many musical respiratory ronchi.
- There is no cervical or axillary lymphadenopathy.

Central nervous system:

- Cranial nerves intact
- Motor and sensory pathways intact
- Reflexes brisk and equal, the plantar are flexor
Differential Diagnosis:
1. Malignancy of the colon
2. Crohn's disease
3. Ulcerative colitis
4. Reticulosar affecting the colon
5. Diverticulitis

Investigations:
1. Hemoglobin: 79%
   ESR: 51 mm/1st hour
   WCC: 7,700 / cu. mm. - neutrophils 63%
   lymphocytes 30%
   monocytes 6%
   basophils 1%
   eosinophils -

2. Urine: no albumin, sugar, ketones, cells or cast
3. Faecal occult blood: +++
4. Bacteriology of rectal discharge: normal bowel flora plus a penicillin-sensitive staphylococcus aureus
5. Proctoscopy: no visible piles; bright red blood and creamy discharge obscuring the mucosa
6. Sigmoidoscopy: this showed a very red rectal mucosa with several ulcers exuding yellowish pus high up - about 18 cm. - the mucosa was even more congested, thickened and friable.
7. Barium enema: this showed a long segment of irregular narrowing in the proximal sigmoid colon. The section was mobile and did not fit in any position. The radiologist's opinion was that it represented an infiltrative lesion, probably a carcinoma or one of the reticuloses.
8. Laparotomy: 21/2/61
   A left paramedian incision was used, and revealed a short segment of narrowed and inflamed bowel with no signs of tumour growth and no
enlarged glands. Local resection and an end-to-end anastomosis were carried out.

9. Pathology report: This showed the presence of diverticulitis plus a localised area of tuberculous colitis with typical giant cells and follicular formation. Special stains revealed two tubercle bacilli. The specimen contained all the affected tissue so no further surgical treatment was deemed necessary.

Further Progress:
The patient made a rapid and uneventful recovery from his operation and was transferred to the City Hospital for full anti-tuberculous chemotherapy with streptomycin, PAS and isoniazid. It was thought likely that he would stay in hospital for 3 months or so and then continue treatment at home for a further 15 - 18 months.

Discussion:

Neoplasia of the colon usually occurs in patients over 50 but is not rare earlier in adult life and as it is of such serious prognostic significance, could not be disregarded as a possible cause in this case. Several things seemed to point to the diagnosis of carcinoma - the alteration of bowel habit, the loss of weight and anaemia and especially the bleeding per rectum. The barium enema findings seemed to confirm the suspicion especially as almost a quarter of all carcinomata of the colon occur in the sigmoid.

Malignant tumours of the sigmoid colon tend to be of the annular or tubular type and as the faecal content is fairly solid, the lumen of the bowel relatively narrow, the main symptoms
tend to be obstructive. Thus the commonest symptom in left- sided colonic carcinoma is alteration in bowel habit — present in 70% of cases. Typically an adult who has had regular bowel movements all his life rapidly finds increasing difficulty in getting the bowels to move and has to take increasing doses of purgatives — nearly the picture in this case. Because of the drastic purgation or because of imitation by the cerebals above the constipating neoplasm attacks of constipation may be followed by diarrhea. Blood and mucus in the stools are typical of a growth situated low in the colon.

Mr. Christie did not have the other common symptoms of abdominal pain, a palpable lump and tenesmus. Abdominal pain is not such a constant feature in carcinoma of the sigmoid as in the rest of the left colon and when it occurs is colicky in nature rather than the low dull ache of the other lesions. The palpable mass is often not the growth itself but impacted feces above it, which characteristically can be indented by the finger. Proliferative growths low in the colon often give rise to tenesmus — ineffectual and painful attempts at defecation — which may be accompanied by passage of blood and mucus, especially in the early morning. Bladder symptoms are not unusual and may herald the formation of a colorectal fistula. Loss of weight is slightly commoner in sigmoid lesions than elsewhere in the left colon but anaemia and vomiting hardly ever occur. All the other symptoms and signs of carcinoma of the colon are discussed more fully in earlier cases.
This case does serve to demonstrate the step in investigation of suspected colonic neoplasm. In every case it is necessary to do a rectal examination, a sigmoidoscopy and a barium enema to prevent the overlooking of any part of the lower bowel. A digital rectal examination covers the distal 10 cm. of bowel, sigmoidoscopy the distal 30 cm. and barium enema the whole colon proximal to 16 cm. from the anus. Thus a rectal examination plus a barium enema, omitting sigmoidoscopy, would fail to examine a vital 5 cm. of bowel where many growths do occur.

Contrast enema is useful, especially in conditions only involving the mucous membrane - the barium enema is partly evacuated and air injected so that the walls are diminished, and a nephogram that failed to alter the contour of the barium-filled colon may be demonstrated. Even as differentiation from inflammatory lesions may be very difficult if not impossible and the final diagnosis may rest with laparotomy and pathology as hyst. Exfoliative cytology, which is now commonly used for lesions of the other end of the gastro-intestinal tract, is now being adapted for examination of bowel content and in experienced hands can be a valuable aid in obscure cases. Satisfactory results require long - rather laborious preparation of the patient - enemas are given until the returning fluid is clear, and after 5 - 10 minutes the fluid is collected, centrifuged and films prepared and stained from the sediment. The presence of malignant cells in these films is conclusive evidence of the presence of malignancy. Successful diagnoses have been made by this method in growths in all parts of the colon.
but it is still a long way from being a routine procedure.

Among the other conditions entering into the differential diagnosis was leishman's disease. This "regional enteritis" can be found in the large bowel as well as the small, though not so commonly, and may present a picture very like carcinoma of the colon. The history is usually longer and characteristic other segments of the intestine are also involved - none of these "skip" lesions were shown in this case, but occasionally only one area is obviously involved. Pain, diarrhoea and fistula formation are the three most common symptoms of leishman's disease - none of these were present in this case. Occasionally it presents as an unexplained anaemia or pyrexia.

The cause of leishman's disease remains uncertain. The histological appearances are very like tuberculous and sarcoidotic, but it is probably quite different from these. Eosinophilic infiltration is common - an allergic theory is postulated - of interest in this case because of the asthma and skin eruption already present.

Ulcerative colitis was another candidate mainly because of the passage of blood and yellowish slime in the stools. Here again, however, diarrhoea is usually the first or main symptom though constipation may occur, especially in distal proctocolitis, and the bowel may be loaded with faeces. The radiological findings vary with the phase of the disease - with at first fine stricture followed by loss of haustration and finally a smooth, shortened, narrow bowel. Here again the etiology is obscure - infectious, allergic...
nutritional and psychosomatic theories having been advanced. Partial control by large doses of methylphenidate was Aimed to support the infective theory while improvement on withdrawing milk from the diet seems to point to an immunological response to milk proteins (Tsoh, 1961). In this case ulcers were found in the colon and the mucosa was congested, thickened and friable but this was probably due to secondary invasion by the Staphylococcus aureus which was isolated. Staphylococcal ulcers of the bowel are rare except in suppurative ulcer after use of broad-spectrum antibiotics but the fact that the bowel was already diseased might have made invasion easier.

In an older patient, diverticulitis would have been higher on the list of differential diagnoses. Although colonic diverticulosis is relatively common, diverticulitis is a comparatively rare complication and is uncommon before the age of 40. 75% of cases are over the age of 60. Increased intracolic pressure due to chronic constipation or spasticity is supposed to be the cause of diverticula - formation and blockage of the neck of the diverticulum with impaction of faeces followed by secondary infection causes diverticulitis. Pain in the left iliac fossa is the commonest complaint, sometimes with haemorrhage and passage of mucous per rectum. There were in fact a few diverticula in the rectal segment of bowel in this case but their presence was probably incidental and unlikely to have been the cause of any of the symptoms.

Diagnosis of a retrocecal was almost purely a radiological concept, in spite of
the enlarged inguinal glands. Lymphosarcoma and reticulosendotheliosis of the large bowel do occur, but are very much rarer than carcinoma. Lymphosarcoma may arise from the lymphoid tissue of the Peyer's patches and is rapidly and steadily progressive with erosion of surrounding structures and could cause constipation and rectal bleeding, though more commonly causing chronic diarrhoea. An even less likely cause is intestinal amoebiasis which sometimes gives rise to alarming rectal haemorrhage, but this is always preceded by diarrhoea.

The treatment of such a case of rectal bleeding as "piles" is not a far with the diagnosis of "chronic oligosymphy" in the first case of carcinoma of the stomach. If this had included been carcinoma of the colon the delay could very well have been fatal. Haemorrhoids are extremely common and bleeding is their main symptom - so much so that they are the commonest cause of anaemia in men - but carcinoma of the colon may compress or cause thrombosis of the superior haemorrhoidal vein may give rise to haemorrhoids. This occurs sufficiently often to warrant it being routine to examine the rectum and recto-sigmoid junction for neoplasm in every case of haemorrhoids.

Eulcus ulus of the colon which was in the end the correct diagnosis in this case, is very rare in this country today. In the cases that have been are usually in the ileocaecal region with the sigmoid colon a much less frequent second. Most cases occur from swallowing infected sputum from a pulmonary infection i.e., they are caused by the human
Sarcillus. Bovine infection from infected milk may also be a source, but is even rarer, especially since all the herds in the country have been tuberculin-treated since December 1960 and the vast majority for several years before. There is always the possibility of an infection starting in a new non-immunized tuberculin-tested herd. But for practical purposes this source of infection is virtually nonexistent. Miss Christie has never to her knowledge obtained milk from a country farm which might have had affected cattle, nor has she ever had any chest trouble apart from the attacks of asthma. Her chest X-ray was quite clear, with not even a calcified lymph node focus to be seen. Such a localized, low-grade infection for known in the bowel argues a high resistance to the tubercle bacillus.

Tuberculosis in the gastrointestinal tract may be ulcerative or hyperplastic. The ulcerative type is always secondary to pulmonary tuberculosis and is characterized by multiple ulcers, their long axis transversely across the intestine, usually in the terminal ileum. The serosa coat is thickened, injected and sparsely scattered with tubercles. Perforation is rare but stricture is a common late manifestation. Diarrhea and loss of weight are the main symptoms. Barium meal often shows Stellato's defect, already mentioned in connection with carcinoma of the cecum, due to hypermotility of the affected segment. Hyperplastic tuberculosis, the type present in this case, also occurs most commonly in the ileo-cecal region. Many cases with this diagnosis, however, have been found to be due to Leshn's disease. This type is more likely to be caused
by the bovine infection in a patient with a high resistance; though in the last when it is more common the human variety is seen often incriminated. The infection establishes itself in lymphoid follicles and spreads to the submucosa and subserous coats; the resulting chronic inflammation causing much thickening of the intestinal wall and narrowing of the lumen. Swarms or later intestinal obstruction sometimes often precipitated by impaction of an enterothelium and tubercle bacilli may also cause perforation, usually secondary to tuberculous peritonitis, arising from a small intestinal primary. Peritonitis, ascites, adhesion formation and acute peritonitis may occur. Tubercle bacilli develop throughout the peritoneum and ascites which usually becomes rolled up and can be palpated as a swelling running transversely across the abdomen.

Treatment of tuberculous colitis consists of resection of the affected segment and inflammatory tissue on either side. In ileoceleal tuberculosis right hemicolectomy in the treatment of choice. The local reaction in this case was more in the nature of an erosion ulceration in the first phase but as all the affected tissue was contained in the specimen and everything pointed to this being the only area involved it was thought unnecessary to reoperate for further resection. Prompt and thorough chemotherapy is the main requirement in such cases. To this end Mr. Lidi was transferred to the Ritary Hospital for thorough investigation and treatment with all these chemotherapeutic agents streptomycin, PAS and isoniazid. Presumably it would be impossible to obtain tubercle bacilli on
which to determine drug sensitivities so the routine therapy of 16 streptomycin intramuscularly per day with 15 G PAS and 200 mg isoniazid orally would be given. After full investigation he will probably be discharged on PAS and isoniazid as pyracamycin capsules to be taken for a year at least as it is most unlikely that he is at all infective.

Problems of management in this case were few. The haemoglobin of 79% was high enough to allow operation but would have to be boosted later by oral ferrous sulphate - 200 mg. three times a day. Bowel preparation before surgery was thorough, with an enema to cleanse the bowel, a high calorie, low residue diet, sucralfate, sulphathiazole 2 G four-hourly for 5 days and thymycin 1 G six-hourly for 2 days. More effective bowel preparation has been one of the main factors in the greatly increased success of intestinal surgery in recent years. The asthma and skin reactions did not affect the outcome in this case though there was considerable bronchospasm once the patient was under the anaesthetic and artificial ventilation of the lungs was necessary throughout the operation. A preoperative bronchodilator might have been useful. Something that could have been avoided with some forethought was the use of iodine and sticking plaster applied with gay abandon on the skin while the patient was in theatre - though in fact the patient seemed little the worse for it afterwards! The question had arisen before operation whether intervention should be postponed until the skin rash had been cleared up but it was decided to proceed straight away...
as the rash had been present for many years, its exact cause was unknown and attempts to improve it might have been difficult or prolonged. Postoperative treatment of colonic stricture includes administration of antibiotics to guard against possible infection of the anastomotic area. Priscoline is usually given by mouth in a dose of 1.5 G four-hourly. Its action is slight, constipating and so is to be preferred to succinylsulphydriole, with its purgative effect which might slight might endanger the patient's life. Watch must be kept for paralytic ileus, as after all gastrointestinal operations, but intravenous fluids and suction were not required in this case. The patient was a little upset at first when told the nature of his complaint — some of the social stigma of tuberculosis still seems to remain — but relieved when it was pointed out that it could have been much worse and that now was certain. In the end, he was quite resigned to treatment at the City Hospital and an transfer his physical condition was very good and his asthma and skin rash improved rather than exacerbated.
Conclusions:

These six cases demonstrate most of the available measures for diagnosis of gastrointestinal malignancy. History and examination still obviously play an indispensable part. While the ancillary methods fail only too often. Of course these cases were chosen to illustrate difficulties in diagnosis and in hundreds of cases X-rays and endoscopy are invaluable but these methods are not infallible and recognition of this fact is itself an aid to correct diagnosis. In all three cases of malignancy X-rays with radio-opaque techniques failed to reveal the lesion. While in the three cases of benign disease the X-ray picture was suggestive of malignancy. The former is easy for the more dangerous situation because one tends to think that if nothing abnormal shows on the X-ray then there can be little seriously wrong.

The aids to diagnosis in gastrointestinal malignancy can be divided into five main groups: history and examination, radiodiagnosis, endoscopy, cytology, and laparotomy and biopsy. It is often said that if one has not formed an opinion as to the likely diagnosis after taking the history and making the examination that ancillary methods will have very little to add—they are in fact more often confirmatory than diagnostic. However, in the gastrointestinal system symptoms and signs are relatively few in number for a very large number of possible diseases—there are many different disease processes. Thus, pain, anemia, vomiting and alteration in bowel habit can arise from a multitude of causes, and...
even their nature, mode and order of onset and duration give only some idea of the underlying disease. Some conditions do have a clear-cut, typical history but malignancy is often vague and insidious, as shown in the first three cases. History may help but little. Examination may reveal distension, rigidity, obvious fistula or a lump, but again this may not clinch the diagnosis. Digital rectal examination is probably the most important step in examination and certainly leads to the biggest tragedy if omitted - rectal carcinoma is very common but carries a 45% chance of cure if found early enough, but all too often it is missed. Laboratory techniques may be helpful - the faecal occult blood probably being the most useful single test though hemoglobin, white cell count and ESR are also helpful.

Radiodiagnosis plays a large part in detection of gastric- intestinal neoplasia, and is now a highly developed science. Even a straight X-ray is useful in showing fluid levels, gas distension and calcification. Barium meal and barium enema are most useful and the recent development of contrast enema and gastrogafin have made the outlining of the tract even more precise. These procedures are not without danger though injuries are fortunately rare. Perforation of intestinal obstruction has already been mentioned. Perforation of the colon during the course of a barium enema is rare but may happen in a diseased colon, and enema examination should not be carried out too soon after the formation of a fecal impaction about a site of suspected diverticulitis or carcinoma during a barium meal the radiologist learns considerable facts on the abdomen in diagnostic to outline in
much of the stomach and duodenum as possible, and
this are reports of cases in which only these have
performed during the procedure. Gastrografen being
light and easy to use has therefore almost
replaced barium in the more acute gastro-duodenal
problems.

Gastro-intestinal endoscopy is still in the
developmental stage but is already almost essential
in investigation of the upper and lower part
of the tract. The oesophagoscope, the gastroscope, the
proctoscope and the sigmoidoscope have all proved of
value and in all of them pieces of tissue can
be taken under direct vision for pathological diagnosis.
Artetoscopy can be used to inspect intraperitoneal
organs without the necessity of laparotomy but few
surgeons use it. Its chief value is in inspecting the
liver, gall bladder, stomach etc. in patients unfit for
laparotomy. It is performed through a small incision in
the median line near the umbilicus with an instrument
resembling a cystoscope. This is introduced and the
patient is tilted in various directions. Biopsy of the
liver is possible but hemorrhage is not infrequent
and air embolism has been known to occur.

Histology in diagnosis is still in its
infancy and limited in its application. With present
methods, a vast store of experience must be gained
before definite opinions can be given on the
malignancy of a group of cells. So far this method
is not altogether reliable in diagnosing alimentary
neoplasm. The examination of ascitic fluid is sometimes
useful in diagnosing tumours of stomach or colon.

Fims from centrifuged aspirates being stained with
the Papanicolaou technique. Kast (1954) showed that it
is possible to diagnose the type of source of
malignant cells with an overall accuracy of 70%.
Gastric and colonic lesions have already been mentioned. Detection of malignant cells in the blood is possible, and in the future may be helpful in studying therapeutic efficacy. In carcinoma of colon and rectum, cells are found in 35% of Broder Grade II tumours, 78% of Grade III, and 100% of Grade IV.

Laparotomy still remains the diagnostic last ditch. Even here a pathological report may be necessary for precise diagnosis, as shown by the case of leiomyosarcoma and tuberculous colitis. This will remain so until better and more reliable techniques of endoscopy and cytology are evolved. It is obvious desirable that an anatomical and pathological preoperative diagnosis should be made because only then can the operation be planned to meet the patient's needs. An elective operation has far more chance of rapid recovery and subsequent success than one entered upon blindly. This was best shown here by the case of Mrs. Reid, where suspicion of malignancy led to partial gastrectomy when gastro-pejunoscopy & vagotomy would probably have served his better — though in fact her conclusion was trouble-free and she is now very well. However, good investigative methods must still remain the barrister to accurate, early diagnosis of patient, doctor and hospital delay. This is far more difficult to overcome; and is an educational and administrative problem which needs much attention.

Surgery itself has three main parts to play in gastrointestinal malignancy — it may be diagnostic, palliative or curative. Diagnosis consists of laparotomy and biopsy. Sometimes the diagnosis is obvious to the naked eye, as in the gastric and
colonc carcinomata, but often it needs microscopic pathological confirmation as in the leiomyosarcoma, the tuberculous colitis, the fecal fistula and the pyloric stenosis. The palliative aspect of surgery has not been demonstrated in these six cases, but palliative resection or short-circuit operations may be performed in carcinoma of colon or rectum and local resection in inoperable gastric carcinoma.

The curative aspect of surgery is its most satisfying one but gastro-intestinal neoplasia is not its but exponent. Surgery is indeed curative in very many of the non-malignant gastro-intestinal disorders but in malignant lesions the results are very disappointing—mainly because of late diagnosis and rapid spread. The principle of excision of the primary growth with as much surrounding tissue as possible and the immediate lymphatic drainage area in bloc still holds good. Increase in the anatomical extent of these operations has been made possible by technical advances in the services available to the surgeon—anaesthesia, blood transfusion and understanding of electrolyte and hormone disturbances. Indeed, major surgery has now almost reached its limit and further advances will depend more and more on radiotherapeutic and cytotoxic measures. The development of the linear accelerator and perfusion technique is probably the first step in better prognosis for gastro-intestinal neoplasia.

At present the prognosis varies considerably though in general the more common malignancies seem to be the slackest. Thus the 5-year survival rate may be as low as 5% in gastric carcinoma but is 35% in carcinoma of the colon and even higher in less malignant but less common forms such as carcinoid tumours.
Benign tumours should all be cured by surgical excision, an exception being familial intestinal polyposis where not all the growths can be excised before malignancy supervenes.

Combination of all the modern methods of diagnosis and treatment is gradually but steadily improving the picture in gastro-intestinal neoplasia, and with the possibility of newer and better techniques in the future the outlook is not quite so gloomy as it at first appears.

Summary:

Six cases are reported of gastro-intestinal disease, three being malignant conditions presenting as benign lesions and three with the diagnosis of malignancy eventually proving to be benign. The differential diagnosis of each case is discussed and comments made on its management and prognosis. The methods for diagnosis of gastro-intestinal neoplasia are briefly outlined and the role of surgery considered.
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