THE PATTISON PRIZE in CLINICAL SURGERY.

"THE SURGICAL MANAGEMENT of CONDITIONS commonly associated with JAUNDICE".

by

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(June 1958).
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ACKNOWLEDGEMENT.

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CASE HISTORY

of

GALL-STONE ILEUS

Past History:

This patient was in very poor health until February of this year when she suffered an attack of persistent vomiting and nausea lasting for a week or so. In May, she took a severe pelvic pain, right hypochondriac, which was in stools for some hours. She did not notice any change in the colour of her stool or stool. Her doctor treated her at home and enema was given repeatedly about once a month. On the second day (5/2/57) prior to admission she once again started to vomit, but on this occasion she was initially acutely ill, continued to vomit until admission on Friday 5/2/57. To be sure of diagnosis she was admitted to hospital.

On admission, she was moderately ill, although she was not vomiting or diarrhoea. Her urine was not particularly alkaline and no abnormality was noted in the stools. She had recently lost some weight. The urine had been normal in culture. She had not noticed any change in colour of the stools. Her urine was not particularly alkaline.

She stated that she had recently lost some weight, and she had not noticed any change in stool colour. She had not been vomiting or diarrhoea. She had been normal in colour.

Present Illness:

On admission, she was moderately ill, although she was not vomiting or diarrhoea. Her urine was not particularly alkaline and no abnormality was noted in the stools. She had recently lost some weight. The urine had been normal in culture. She had not noticed any change in stool colour. She had not been vomiting or diarrhoea. She had been normal in colour.

Family and Social History:

She lives for 10 years, she lives alone in Wimbledon. A history of 10 years who is alive and well.

On Admission:

Occurred but fairly well spread middle aged lady who showed no obvious symptoms of anaemia and who did not appear to have distress pain. There was no significant lymphadenopathy, no lymph nodes palpable or prominent. She was of average intelligence but good health.

Allergies:

None.

Tongue: Dry and constricted threads somewhat feathery. Normal, irritability normal and no aspiration exists.
Name: Mrs H.C. (62)
Occupation: Widow of independent means.
Date of Admission: 27/9/57.

Present History:—
This patient was in very good health until February of this year when she suffered an attack of persistent vomiting and jaundice, which lasted for a week or so. In May she took a severe pain in the right hypochondrium which came in bouts for some hours at a time. During each attack the severity of the pain was fairly constant. She vomited frequently at this time and was troubled with flatulence, but was not jaundiced. She did not notice any change in the colour of her water or stool. Her doctor treated her at home and her symptoms cleared up completely after about one month.

On the Monday (23/9/57) prior to admission she once again started to vomit, but on this occasion there was initially no pain. She continued to vomit until admission on Friday 27/9/57 but on the day of admission she began to experience "cramp-like" pains across the middle of the abdomen. These pains were not particularly severe and were altogether different in character and distribution from the pain described above which she had in May. Her bowels had been rather constipated but they did move on the morning of admission. Since then, however, she passed no further motions and no flatus per rectum although she was much troubled with flatulence orally.

She thought that she had recently lost some weight, but apart from the attacks of vomiting her appetite had been good. The urine had been normal in colour as far as she could remember and there was no dysuria or frequency. There was no history of cough, chest pain or undue breathlessness and no swelling of the ankles.

On admission she felt weak and exhausted.

Past History:—
No operations.
An attack of "bronchitis" 5 years ago.

Family and Social History:—
A widow for 10 years, she lives alone in Hawick. A sister, who is in good health, lives in Edinburgh. The patient has a son of 31 years who is alive and well.

On Examination:—
A dehydrated but fairly well spread middle aged lady who showed no obvious cyanosis or anaemia and who did not appear to be in severe pain. There was no significant lymphadenopathy, no finger clubbing and no koilonychia. She was of average intellect but not a very good historian.

Alimentary System:—
Tongue dry and coated; the breath somewhat foetid.
Hernial orifices normal and no operation scars.
The abdomen was obese but not obviously distended. On palpation an area of tenderness was found in the right lumbar region anteriorly, mid way between the right costal margin and the iliac crest.

Guarding in the right hypochondrium was more marked than on the left. The spleen, liver, gall bladder and kidneys were not palpable and no other abnormal masses were detected.

Bowel sounds were present and were suggestive of increased peristalsis.
Rectal examination revealed nothing remarkable.

**Cardiovascular System:**
- Pulse = 76/min., regular in time and force.
- B.P. = 120/70 mm Hg.
- No jugular venous engorgement and no sacral or ankle oedema.
- A.P. = 5th I.C.S. within M.C.C. Normal character.
- H.S. = Both sounds heard in all areas, clear and closed with no abnormal accentuation. No murmurs.

**Respiratory System:**
- Breathing = 20/min., regular in rate and of normal character.
- Trachea central.
- Chest symmetrical in form and movement. Expansion moderate.
- P.N. = normal and equally resonant throughout.
- B.S. vesicular in all areas without accompaniments.
Although there were many features lacking in her previous history, it was nevertheless fairly clear that in May she had an acute attack of biliary colic. Her pain on admission, however, was entirely different to that experienced in May and was of the nature of a true intestinal colic. The association of persistent copious vomiting, the absence of obvious distension and the presence of early dehydration were all suggestive of a high obstruction, but the fact that her bowels continued to function for as long as a whole week after the onset of symptoms suggested that the obstruction was not complete. The presence of normal hernial orifices and the absence of any history or sign of a previous abdominal operation ruled out the two most common causes of intestinal obstruction. Idiopathic intussusception in adults is extremely uncommon in this country, but intussusception secondary to a papilloma, submucous lipoma or malignant growth may occur. Some variety of internal hernia might have accounted for her symptoms. A partial volvulus in the small intestine capable of untwisting itself was another possibility.

However, the most likely clinical diagnosis was a gall-stone ileus. There was a history of previous biliary colic, the patient subsequently presented with a high intestinal obstruction which was partial rather than complete, and the patient was of the appropriate age and sex.

Vomiting persisted for several days after admission and her fluid and electrolyte balance had to be maintained by intravenous infusion.

A straight X-ray abdomen (erect and supine) showed a localised distended loop of small bowel lying between the stomach and colon in the left upper and mid abdomen (see fig.4) The distribution of gas shadows throughout the rest of the bowel was normal. There was no evidence of a calculus in the gall-bladder area. These appearances indicated a local ileus or obstruction of the small bowel segment and merely confirmed the clinical findings.

A subsequent straight X-ray abdomen, however, demonstrated clearly the presence of gas in the biliary tract and this clinched the diagnosis of gall-stone ileus (see opposite). The only rational course of management was to operate and remove the gall-stone.

4/10/57. Operation.
Under general anaesthesia the abdomen was opened through a right upper paramedian incision and the small intestine examined. In the upper part of the jejunum a large hard body about 1" x ½" was found in the intestine. This was readily moved proximally along the intestine away from the site of obstruction. A longitudinal incision was made in the intestinal wall and the stone delivered /
Fig. 1. Pre-operative straight X-ray abdomen (erect) showing a localised distended loop of small bowel.
Fig. 2. Pre-operative straight (portable) X-ray abdomen clearly demonstrating the presence of gas in the biliary tract.
Fig. 3. A photograph of the calculus removed from the jejunum.
delivered through the wound. The intestine was then stitched up transversely. The abdominal wall was closed with continuous catgut, and with interrupted silk to the skin.

A photograph of the stone is shown.

Her convalescence was complicated by the development of an infected haematoma which produced much systemic upset and a brown watery foecal-smelling discharge from the wound. The stitches were taken out to promote drainage and a buffer parté applied to the surrounding skin. The wound was dressed with gauze held in place with cotton wool and elastoplast. The wound exudate became thick and opaque and diarrhoea developed, but the stool contained no salmonella or shigella organisms nor any cellular exudate.

A swab from the abdominal wound produced a growth of *B. coli*. Systemic antibiotics were not given for they are without value when pus has already formed and are unnecessary when drainage has been established.

She continued thereafter to make slow but steady progress and was discharged home free from symptoms on 2/11/57.

Once she was over the dangers of intestinal obstruction attention was turned to the condition of her biliary tract. As there was no evidence of gall-bladder function with 'Telepaque', "Biligrafin" cholecystography was carried out before she left hospital. As previously noted gas outlined the biliary ducts. Some contrast medium had entered the common bile duct. Translucencies in the biliary tract were consistent with air bubbles, but might also have represented small non-opaque calculi. The gall-bladder contained gas but no contrast medium and its shadow was distorted. It therefore appeared that there was a partial or complete obstruction of the cystic duct. There was still some gaseous distension of the small intestine. A repeat intravenous cholecystography on 21/11/57 gave much the same picture except that no calculi were demonstrated, but once again the gall-bladder failed to fill.

Two months later she was re-admitted for cholecystectomy. Apart from one bout of abdominal pain which was fairly severe but only lasted 10 minutes, she had been in excellent health during this interval. Her appetite was excellent and she had gained weight. 13/1/58. Operation - Cholecystectomy.

The abdomen was re-opened, but this time through a Kocher's incision and after division of adhesions around the duodenum a fistula between the gall-bladder and the duodenum was demonstrated. The gall-bladder was then divided close to the duodenum and its distal fistulous part was then oversewn with plain catgut and invaginated into the lumen of the duodenum. The remainder of the gall-bladder was then excised in the usual manner after ligation of the cystic duct. The abdomen was closed with catgut and black silk to the skin, a tubular drain being left in position.

The pathology report revealed nothing remarkable - "chronic cholecystitis"
Apart from a slightly discharging wound her post-operative progress was excellent.

**Discussion.**

Gall-stone ileus is one of the more unfortunate forms of intestinal obstruction. It earns its highly lethal reputation on several scores. The obstruction, as exemplified in the present case, is frequently only partial and therefore is not particularly clement. There is no interference with the blood supply of the bowel wall to claim the same attention as an "acute abdomen". Secondly, the patient has already been complaining no doubt for many years of abdominal pain caused by acute exacerbations of chronic cholecystitis. Yet another attack is scarcely unexpected and the medical attendant may not take sufficient care to elicit from the patient's story the different nature of the abdominal pain. In this way the symptoms of intestinal obstruction are overlooked until much later, when the patient is grossly dehydrated and in peripheral circulatory failure. The treatment is then hazardous in the extreme. Finally, the fairly advanced age of most patients with gallbladder ileus plays its part in instigating against a favourable prognosis.

There are two possibilities explaining how a gall-stone may get into the ileum. It may pass via the common bile duct, but a stone sufficiently small to manipulate this passage would in all probability pass right through the alimentary tract and be passed per rectum. A more common route is for the stone to ulcerate either through the fundus of the gallbladder or through Hartman's pouch into the subjacent duodenum. In the present case air in the biliary tree demonstrated on straight X-ray of the abdomen proved the existence of internal fistula between intestine and gallbladder. That this fistula was into the duodenum and not into the transverse colon (as sometimes may occur) was suggested by the clinical features of high intestinal obstruction and subsequently proved at the time of her cholecystectomy.

The site of obstruction about two feet from the duodeno-jejunal flexure was unusually high. It is more common for the stone to impact about two feet from the ileo-caecal junction. This high site of obstruction is compatible with the passage of a stool on the morning of admission, the absence of distension and the early onset of vomiting and signs of dehydration. Straight X-ray of the abdomen (27/9/57) showed a portion of distended small intestine, but there was singularly little of it. The fact that no stone was seen on straight X-ray is not unexpected, since only 20 - 25 per cent of biliary stones can be demonstrated in this manner.
The operative procedure to remove the stone deserves some comment. From the size of the stone and the collapsed state of the distal bowel there was of course no difficulty in localising the site of obstruction. Although viable the tissue at the site of obstruction would no doubt be oedematous and unsuitable for stitching. The stone, which was readily displaced, was therefore milked along the gut in a proximal direction until it reached a segment of more healthy bowel. A longitudinal incision was stitched up transversely so that if anything the bowel would be widened at the site of operation rather than constricted.

Elective cholecystectomy was subsequently performed when the general health of the patient had been fully restored. Cholecystectomy with eradication of the fistulous connection between the gall-bladder and duodenum was clearly necessary if the great risk of further attacks of acute exacerbations of cholecystitis with possible cholangitic spread was to be avoided. With that completed the patient was discharged home with the confident prognosis of cure.
A CASE HISTORY

of

MYOCARDIAL INFARCTION complicating unrelieved BILIARY OBSTRUCTION due to STONE.
Name: Mrs H.K. (57)
Occupation: Housewife.
Admitted: via S.O.P.D. 6/4/57

Complaints

Anorexia, vomiting, abdominal pain with jaundice, dark urine and pale stools. Repeated episodes for many years, but particularly during the past ten days.

Present History

For the past ten days this patient had severe right subcostal pain going through to the back and occasionally to the right shoulder. The pain came in spasms lasting from ½ hour to 1 hour and had no relation to meals. During this period she was jaundiced, anorexic and vomited white frothy material practically every day. She usually vomited about a quarter of an hour after meals. In general, her diet consisted of hot fluids and very little solid food.

The attack prior to admission was the most severe she had suffered for many years. She had a cholecystectomy in 1934, subsequent to exploration of the biliary tract in 1923. During the past twelve months she had two such attacks, and after the first of those she attended the Western General Hospital as an out-patient, when a "biligrafin" examination of her biliary tract was arranged.

Unfortunately, she proved to be sensitive to iodine. As she was particularly anxious to avoid having an operation, and as she seemed satisfied to continue as she had been doing in the past, it was considered reasonable at that time not to admit her. She was encouraged to report should her attacks become more severe or persistent.

General History

In October 1956 she attended M.O.P.D. with angina and had been taking trinitrii tablets ever since. There had been no undue breathlessness, no swelling of the ankles, no cough or spit and no nocturia.

Past History:-- Nothing else remarkable.

Social History:-- Lives with husband. No family.

On Examination:-- An obese middle-aged woman with severe shock, obviously jaundiced, sweating and slightly cyanotic.

Cardiovascular System:-- Radial Pulse 120/min. regular in time and force, but thready in volume. Vessel wall palpable.
B.P. = 60/36 mm Hg bilaterally in arms. No pulsus alternans.
No jugular venous engorgement, very slight degree of ankle oedema, but no sacral oedema.
Heart:—
Apex beat not accurately localised.
The first and second heart sounds were present but faint, except in the mitral area when the second sound was accentuated. No triple rhythm. No murmurs. No pericardial friction rub.

Respiratory System:—
Breathing was rapid (28/min.) and rather shallow.
Chest symmetrical in form and movement, but expansion was poor.
Trachea central; no axillary or cervical lymphadenopathy.
Percussion note resonant throughout but with preservation of normal liver dullness.
Breath sounds vesicular with bilateral basal crepitations.
Vocal resonance normal and equal in all areas.

Alimentary System:—
Tongue dry and furred. Dentures.
Abdomen: Markedly yellow and obese; but probably not distended.
Right paramedian and Kocher's incisions. The abdominal wall moved with respiration. Hernial orifices were normal. Tender on palpation in the right hypochondrium and also in left iliac fossa with some guarding in these areas. The presence of the abdominal incisions made palpation of the gall-bladder region difficult. An indistinct mass was felt in this area - ? liver.

Nervous System:—
Pupils were circular, central and equal; reacted physiologically to light (direct and consensual) and to accommodation. There was no significant retinopathy. The other cranial nerves were tested individually and all found to be fully functional.
Reflexes:—
R  +  +  +  +  +  +  - -  ↓
L  +  +  +  +  +  +  - -  ↓
DISCUSSION.

1. Diagnosis.

a). Jaundice, abdominal and shoulder pain, pale "putty" stools.

This classical triology of symptoms on admission clearly indicated the presence of obstructive jaundice. The dark urine contained no urobilinogen. The diagnosis of obstructive jaundice was further confirmed by the long past history of biliary complaints. At the age of 17 years she had her common bile duct explored, probably with the provisional diagnosis of choledochous cyst in mind. This was followed by cholecystectomy at the age of 28 years. The recurrence of stone after that operation is not at all uncommon inspite of every care that may be taken to prevent such a relapse. The cholecystectomy was successful in that it was followed by seven years freedom from all symptoms. The subsequent development of bouts of painless jaundice which later became associated with biliary colic leaves little doubt that over the years she had collected another crop of biliary calculi. 'Biligratin' cholecystectomy was arranged in 1956 but she proved to be hypersensitive to iodine and further investigation was not carried out.

Although she was afebrile on admission, the white cell count (WBC) was raised to 20,000/c.mm. This suggested a possible cholangitis, but as will be discussed later, there is an alternative explanation.

b). Shock.

Unlike the typical case of biliary obstruction due to stone this patient was admitted in a state of shock. She looked hypovolaemic and was mildly cyanosed. The blood pressure was low (60/36 mm Hg) and the pulse rate rapid (120/min.). There was nothing in the immediate history to indicate the cause of the state of shock; pain in the right shoulder could readily be explained as being referred from the biliary region. There was no obvious site of bleeding, although this could have been internal. There was no history of chest pain to indicate infarction or pulmonary embolism and the breathing, although more rapid and shallow than normal, was not grossly distressed and there was no haemoptysis.

Obstruction at the sphincter of Oddi due to calculus, oedema or spasm might have been responsible for an attack of acute pancreatitis, which in severe cases is associated with profound shock with cyanosis, clammy skin, rapid thready pulse and a subnormal temperature.

There was no particular reason to diagnose adrenal failure, but it was another possibility.

In spite of the absence of a clear history of chest pain referred down the arm or into the neck and of vice-like character, the past history revealed that she had suffered from angina pectoris.
pectoris and had attended M.O.P.D. in 1956 on that account and Trinitrini tablets had been prescribed at that time. Myocardial infarction was therefore the most probable cause for the state of shock. There was no triple rhythm or friction rub and no jugular venous engorgement, but bilateral crepitations were heard at the lung bases. A white cell count of 20,000/c.mm is not uncommonly met with following a large myocardial infarct.
On admission the patient's condition was such as to altogether exclude any immediate operation on the biliary system. Penicillin and streptomycin were given to allay any cholangitis that may have been responsible for the raised white cell count. Straight X-ray of the abdomen showed small opacities to the right of the lower lumbar spine, but these were not typical of the appearance of biliary calculi.

Neither X-ray nor electrocardiography (ECG) were immediately helpful in indicating the cause of her shocked state. Apart from some doubt about whether or not the heart was enlarged the only possible abnormality reported was some increased prominence of the basal lung markings, which conformed with the clinical findings of bilateral basal crepitations. The ECG taken on admission was essentially similar to what it was a year ago when she attended M.O.P.D., but "there just might have been a posterior infarction".

The further management of the case took the form of a series of quasi-diagnostic therapeutic tests for in general it is a sound principle that, when in doubt about the diagnosis, diagnose the treatable condition, and treat it rather than accept passively the diagnosis of some relatively untreatable but perhaps more probable condition such as myocardial infarction.

Thus, although adrenal failure was hardly the most likely explanation of her shocked state, an intravenous infusion of hydrocortisone was started. This produced no improvement over a period of two hours and was abandoned. Another eminently treatable condition was haemorrhage and, as mentioned earlier it was possible that this patient had lost blood internally. Three pints of blood were given in as many hours, but the blood pressure and pulse rate showed no significant response (see charts). Not everyone would agree that a fairly rapid transfusion of blood is the best thing in a situation such as this. When myocardial ischaemia with evidence of left sided failure (crepitations at the lung bases) is a possible diagnosis Blood was taken for serum amylase determination but this was found not to be significantly raised (17 Wohlgemuth units/ml.)

A repeat ECG was then done and by this time - some five hours after the first recording - quite definite evidence had developed in the tracing and the presence of a posterior myocardial infarct could be diagnosed with confidence. Thereafter, the treatment of the shocked state was in terms of myocardial infarction.

Morphine, oxygen and intravenous heparin were administered according to standard treatment. In addition, intravenous digoxin (0.75mg) and a noradrenalin drip (2mg/litre intravenously at a rate of 40 microgrammes/min.) were given - both of which contribute somewhat controversial therapy. The risk of intravenous digitalis in myocardial infarction is, of course, ventricular fibrillation; a complication which usually proves to be fatal. Such treatment would have been definitely contra-indicated in the presence of...
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# Fluid Balance Chart

## Treatment

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100 mgms HYDROCORTISONE in 250 ml. 0.9% saline started 9:55 p.m.

3 ml BLOOD at 5:45 p.m., 6:25 p.m., 6:50 p.m. respectively.

12,500 with HEPARIN IV at 10 p.m.
NoraBrenacine Drip
8mg in 540ml 5% glucose.

6/4/57 - 7/4/57

Remarks:

D/c. in 0.75mg
At 11:15 pm.

On Oxygen

Morphine 1/2 - 8c 11/5
of extrasystoles, but in their absence there is possibly a place for it in view of the fact that the tachycardia and low blood pressure are the result of myocardial hypotonicity. In the present case, however, 0.75mg digoxin intravenously had only a very temporary effect in slowing the heart rate and its effect on the blood pressure was confused with the almost coincidental start of the noradrenalin drip.

There are some who maintain that there is no place for the intravenous infusion of noradrenalin in the treatment of shock except in the form of replacement therapy - after bilateral adrenalectomy or overdosage with ganglion blocking agents. Noradrenalin, which is a wholly vasoconstrictor drug, raises the blood pressure mainly by its peripheral action on the arterioles rather than by increasing the cardiac output. Consequently, noradrenalin is as it were a means that defeats its own end. The raised blood pressure does not improve the peripheral circulation, but rather it is achieved at the latter's expense. Granted the raised pressure in the aorta may improve the coronary flow, but this gain is probably largely lost by the increased work the heart has to do in pushing out the same stroke volume against greater resistance. The noradrenalin drip is only used in extremis and then possibly more for the comfort of the clinician than any good it might do to the patient. Renal "shut-down" (anuria) is not uncommon complication in those that survive. In the present case the noradrenalin drip and a subsequent course of "wyamine" produced no very striking improvement.
1. **Biliary System**

Clinically the jaundice persisted, although fluctuating somewhat in intensity. The pain became easier and she had no further attacks of "colic". Shortly after admission she became increasingly drowsy in spite of reduction in the amount of sedative (phenobarbitone administered. Furthermore, on the third day, the mouth began to droop on the right side and some weakness of the right arm developed. A third clinical sign of advancing hepatic failure was the occurrence of two attacks of spontaneous epistaxis several days later which required packing of the nose. An injection of heparin produced a massive subcutaneous haemorrhage in her arm (fig.1)

The changes in the blood chemistry are shown in the adjoining table and include the following significant features. (Table)

- a) The raised but fluctuating level of serum bilirubin which is not atypical of intermittent biliary obstruction by calculi.
- b) The liver function tests showed the alkaline phosphatase level to be high but not as high as might be expected from a purely obstructive lesion. The presence of superadded liver damage is confirmed by the raised CCFT, the reduction in the plasma albumin level and alteration in the albumin:globulin ratio.
- c) The prolongation of the prothrombin time was probably due to a combination of impaired intestinal absorption of vitamin K consequent upon the deficit of intestinal bile salts and impaired liver function.
- d) The markedly raised blood ammonia confirms the clinical diagnosis of developing hepatic failure.
- e) Hyponatraemia is a common feature of liver failure. The cardiac condition continued to make her an extremely poor surgical risk and in the view of the physicians "the risk of operation is such that the cardiac state contradicts it unless she is almost certain to die of her unrelieved abdominal condition". Had it not been for the poor cardiac prognosis perhaps the developing hepatic failure might have received more enthusiastic treatment at an earlier date. The dietary intake of protein was reduced and caloric requirements were supplied by 50 per cent glucose via caval catheter to diminish endogenous protein metabolism as much as possible. In addition an oral antibiotic (sulphamethoxazole 0.25 G. 6 hourly) was given to sterilise the alimentary tract and prevent the formation of toxic nitrogenous substances by bacteria. Vitamin K was given with the intravenous infusion in an attempt to improve the prothrombin time.

2. **Cardiac.**

The blood pressure rose to 100/60 mm Hg on the third day, but failed to improve beyond that. The pulse rate settled at 80/min. for several days but later rose again. The signs of congestive cardiac failure progressed gradually and were subsequently treated with
with oral digitalis. The fluid balance chart illustrates well
the associated discrepancy between fluid intake and output, and
also the marked response to an injection of mersalyl (fig. 5).
An E.C.G. on the third day showed little change from the
diagnostic one on the evening of admission. On the seventh day
some healing changes were evident in the posterior myocardial
infarction. On the fourteenth day after admission she had some
chest pain and the blood pressure fell to 78/50 mm Hg. An E.C.G. (fig. 8)
showed evidence of further extension of the infarct and she shortly
died.
Fig 1. Jaundice and epistaxis.

Fig 2. The response to an injection of heparin.
Fig. 3  Summary of progress and management.
Fig. 4  Graphic representation of serial biochemistry.
Fig. 5. Fluid Balance Chart.
Fig. 6
ECG. 19/11/56.
Normal sinus rhythm rate 88 per minute.
PR interval 0.12 of a second.
The record is within normal limits.

Fig. 7
ECG. 6/4/57
Comparison with the previous record of 19/11/56 shows change. The Q waves in lead III are present as before but there is subsequent ST elevation and the ST segments in lead I, AVL and V4 to V6 are depressed. The record suggests that there just may be a posterior myocardial infarction.
Direct Writer about 7.0 p.m. 6/4/57. (record not available).
Compared with the record earlier in the day (fig. 7) it showed
definite evidence of posterior myocardial infarction with Q waves
in leads $\overline{11}$, $\overline{111}$ and $aVF$. There is ST elevation and T wave
inversion also in these leads. In addition right bundle branch
block has developed.

9/4/57: little change.

Fig. 7 ECG 13/4/57
Comparison with previous records of 6/4/57 and 9/4/57 showed
persistence of right bundle branch block and there are some
healing changes evident in the established posterior myocardial
infarction.

19/4/57. - record not available.
Comparison with the previous record of 13/4/57 (fig. 8) showed
some change. There is evidence to suggest that there has been
postero-lateral extension of the myocardial infarction.
## Biochemical Investigations

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Post-Mortem.

A copy of the post-mortem report is appended. The obstructive jaundice was shown to be due to an impacted gall stone in the ampulla of Vater. The liver parenchyma surrounding the grossly dilated bile ducts was atrophic and showed the early signs of biliary cirrhosis.

Hypertrophy of the left ventricular myocardium in the presence of healthy aorta and mitral valves indicated that the patient was hypertensive prior to the first myocardial infarction. The E.C.G. diagnosis of the site of the infarction was essentially confirmed by the occlusion by soft pultaceous atheroma of the anterior descending branch and the circumflex branch of the left coronary artery.

Comment.

The moral of this case is, perhaps, that it is undesirable to put off operating on gall stones for too long. Gall stones giving rise to definite symptoms such as recurring bouts of jaundice with severe biliary colic should be operated on without undue delay. Some of the possible consequences of failing to do so are illustrated in this case; the development of incipient hepatic failure (clinical, biochemical and pathological) and the inevitable recurrence of symptoms. But in this case the recurrence of symptoms was very severe and at a time when her general medical state prevented any curative measure being carried out.

The clinician, however, cannot order treatment for the patient without first of all getting her agreement. This patient was to have been investigated by "biligrafin" cholecystography in 1956 but proved to be hypersensitive to iodine. Operation was offered at that time, but she was most anxious to avoid it. The problem really amounts to just how much you should try and persuade a patient to have an operation when it appears to be against her wishes.
APPENDIX (cont'd) —— PATHOLOGY REPORTS.

General 
Appearances The body was that of an obese, jaundiced, middle aged female. Post mortem rigidity and lividity were present.

Serous 
Sacs Peritoneal, pleural & peritoneal sacs; showed very many petechial haemorrhages but no other abnormalities.

Cardio 
Vascular System Heart (620g.) was enlarged and this enlargement was confined to the left ventricle. Chambers of the right auricle and right ventricle were of the normal capacity and myocardium of the usual thickness. Tricuspid and pulmonary valves were healthy. No abnormalities were detected in the left auricle. The mitral valve was healthy. The myocardium of the left ventricle was about one and a half times its usual thickness and a yellowish area of necrosis was present in the antero-lateral wall of the left ventricle extending round on to its posterior surface. The aortic valve was healthy. The three major branches of the coronary arteries were grossly atheromatous and the left anterior descending branch and the circumflex branch appeared to be occluded by soft pultaceous atheroma. Aorta: showed atheroma in its arch.

Respiratory System Larynx; Trachea; Bronchi: healthy. Lungs: Rt. lung 650g, Lt. 530g. were normal in size and shape. They were firm in consistence at their bases. Section showed pulmonary oedema.

Alimentary System Pharynx; Oesophagus: healthy. Stomach: Small and Large Intestine: showed congestion of the mucosa and a quantity of blood was present in the lumen of the small intestine. Gall Bladder: had previously been removed. A large mixed gall stone was present at the junction of the left and right hepatic ducts and a similar gall stone was firmly impacted in the ampulla of Vater. Common bile duct was grossly dilated. Liver: (2675g.) was enlarged, soft in consistence and was bile stained. Section of the liver showed gross dilatation of the branches of the hepatic ducts and a third gall stone was present in one of these intra-hepatic branches of the left hepatic duct. Spleen: (295g.) was slightly enlarged, firm in consistence. Section showed congestive changes. Pancreas: was firm in consistence and section showed a considerable degree of pancreatic fibrosis.

Urogenital /
Urogenital System: Kidneys: Lt & Rt 200g. Normal in size and shape. They were soft and flabby in consistence. Capsules stripped easily leaving smooth surfaces. Section, apart from bile staining, showed no abnormalities. Pelves, Ureters & Bladder: healthy.

Endocrines: Thyroid & Suprarenal glands: were healthy.

Microscopic:

Heart: The myocardium reveals gross fibrosis and recent infarction of about 3-4 days duration. The coronary arteries were almost occluded by soft atheroma.

Lung: There was extensive alveolar oedema and congestion.

Liver: The bile ducts were grossly dilated and the surrounding liver parenchyma atrophic and showing early fibrosis.

Spleen: There was congestion of the splenic pulp.

Pancreas: The sections showed peri-ductal and peri-acinar fibrosis.

A CASE HISTORY

of

WALTMAN - WALTERS SYNDROME, HEPATIC FAILURE

and PELVIC ABSCESS consequent to

CHOLECYSTECTOMY.
Name: Mrs Mgt. K.  
Aged: 60. Housewife.  
Admitted: 5/11/57

Complaint: Pain in abdomen and right loin, 10 years.

History: Ten years ago this woman began to have pain in her right loin, stabbing and throbbing in character and aggravated by the cold. It was present for two or three days constantly and was then followed by freedom from pain for some days. During these attacks her abdomen became swollen, but she had no nausea or vomiting, no jaundice and no change in the colour of her urine. This pain was investigated in Chalmers Hospital in 1951 and thought to be due to an old injury of the right kidney.

Nine to ten months ago she began to have a different type of pain, felt in the right upper abdomen and moving round to the back. It was gnawing and shooting in character and lasted about 12 hours on the first occasion. The first time she had it she vomited frequently and had diarrhoea. Subsequently she had about 5 more of these attacks, during which she noticed that her skin was yellow, her urine like "black tea" and her stools pale. She got some relief during an attack by making herself sick. Diarrhoea was not a feature of the later episodes. She also had an occasional sharp pain in her back on the right side below the scapula, but she could not say whether this was associated with her abdominal pain.

Bowels regular. Micturition normal. Weight fairly steady but appetite poor. She has not found that any particular type of food upsets her. "Smoker's cough" with a little clear phlegm in the mornings. No breathlessness. Menopause set 50 years, and since then she attended the R.I.E. on account of a dark brown vaginal discharge. This was cured by cautery of the cervix.

Previous History:  

Social History:  
Separated from her husband, a labourer in an engineering firm. 3 sons alive and well. Smokes 10 cigarettes daily.

Examination: A very voluble witness. Looks unwell, but not at present icteric.


Abdomen: Symmetrical, moved freely on respiration. Striae gravidarum. Tenderness but no guarding in left hypochondrium. An ill-defined soft mass was palpable in the right hypochondrium extending from below the right costal margin. It was tender...
tender and moved on respiration. Spleen and left kidney impalpable. Hernial orifices normal.

Rectal Examination:- Normal

Cardiovascular System:-
  Pulse 75/min. regular in time and force.
  Blood Pressure 160/105. Apex beat in the 5th interspace within the medioclavicular line.
  Heart sounds normal.

Respiratory System:-
  Rhonchi in mid and upper zones of right lung field.

Central Nervous System:-
  Pupils round, equal, regular, reacted to light and accommodation. Other cranial nerves intact. Deep reflexes present and equal. Plantar responses flexor.

Stool:- Ham's test - negative.
CLINICAL DIAGNOSIS

The ten month history of repeated attacks of severe right upper abdominal pain radiating through to the back and associated with obvious jaundice, dark urine and pale stools is typical of recurrent obstructive jaundice. There was some argument about the nature of the mass palpable in the right hypochondrium, but it was thought that it was probably her gall-bladder. The question of malignancy was considered. During a period of remission liver function tests showed a normal serum bilirubin and a moderately elevated alkaline phosphatase of 27 King and Armstrong units (see appendix). A cholecystogram done as an out-patient showed a non-functioning gall-bladder. Chest X-ray was negative. A clinical diagnosis of chronic cholecystitis, probably with stones in the common duct, was made. Surgical exploration of her biliary system was clearly indicated.

Progress and Management.

11/11/57. Operation:-

Anaesthesia - General.

The abdomen was opened through a Kocher’s incision. The liver was found to be rotated anti-clockwise and stones could be felt in the distended common bile duct. Omental adhesions were present at the fundus of the gall-bladder, but no stones were felt in the gall-bladder and the cystic duct appeared normal. The common duct was opened and the stones and gravel evacuated. A rubber catheter was inserted up and down the duct and it was washed out with saline. A bougie was then passed down the duct and the duodenum opened to ensure that the instrument had passed through the sphincter of Oddi. A T-tube was placed in the duct and the incision closed with continuous cat gut. The cystic duct and artery were ligated and divided and the gall-bladder removed. The bed was closed with continuous cat gut and the abdomen was closed in layers.

The pathologist reported mild chronic cholecystitis with cholelithiasis.

Post-operative Complications:--

On the first post-operative day the patient looked unwell. Her pulse rate was rapid and during the day her condition deteriorated and her blood pressure fell. She complained of pain in the right hypochondrium and right shoulder. Although the bile was of a normal colour there was very little drainage via the T-tube. That evening a fullness of the right hypochondrium became apparent and a diagnosis of Waltman – Walters syndrome was made.


The previous Kocher’s incision was re-opened and a collection
of some two pints of bile was found in Morrison's pouch and lateral to and above the liver. When this was evacuated the patient's general health improved considerably. The upper limb of the T-tube was found to be kinked, resulting in unsatisfactory biliary drainage. The arms of the T-tube were shortened and the tube reinserted in place. A large tube drain was led down to the subhepatic space and the wound closed in two layers with cat gut, and the skin with interrupted silk.

Initially her subsequent progress was satisfactory. There was considerable biliary discharge, both from the drain and around the T-tube. About a week later, however, her condition began to deteriorate and she became mentally confused. She then became jaundiced and the possibility of hepatic coma was considered. She was found to be hyponatraemic (127 meq. Na\% see appendix) and to have a blood ammonia of 58 microgram per cent. Other liver function tests at this time showed a high serum bilirubin, and slightly raised alkaline phosphatase, raised zinc turbidity and an alteration in the serum proteins tending towards reversal of the albumin:globulin ratio (see appendix 20/11/57). The treatment of hepatic failure was instituted by passing a caval catheter and giving 25\% glucose intravenously and neomycin 6 hourly. She remained drowsy, hypotensive and unwell for several days but ran no fever of note. A course of crystalline, started after the second operation, was stopped, but even then she did not develop a temperature. A white cell blood count of 38,000 per c.mm. due to a polymorph leucocytosis was noted on 21/11/57. Her general condition continued to deteriorate and in spite of transfusion with two pints dextran she remained hypotensive. A single test dose of intravenous hydrocortisone was given in case she might have adrenal failure, but no response was obtained. Her abdomen then became distended and she developed obvious intestinal obstruction. Laparotomy was indicated.

23/11/57 Operation - Anaesthesia, general.

The initial Kocher's incision was reopened for a second time. A small quantity of pus was found in the layers of the abdominal wall together with a collection of necrotic tissue and infected bile around the region of the gall-bladder bed and common bile duct. Careful examination of all aspects of the liver failed to reveal any loculus of pus, but nevertheless a double corrugated rubber drain was inserted with one leaf going above the liver and the other below. In view of the very high leucocytosis it was felt that there must be a further loculus of pus. There was a large number of adhesions in the peritoneal cavity, and these seemed to be of recent origin. They were divided by the exploring hand and when the hand reached the pelvic brim a large cavity was entered. This contained a foul smelling puruulo-sanguinous fluid. The cavity was evacuated by suction, and a suprapubic stab drain was passed down into it. On palpation the pelvic colon seemed to lie in relation to the left wall of the pelvic abscess, but the nature of the fluid in the cavity did not suggest that it was an independent lesion such as an abscess.
secondary to diverticulitis. The caecum and appendix were likewise palpated and appeared to be normal. Under these circumstances it was not considered advisable to make a lower abdominal incision for direct inspection of the region. The Kocher's incision was closed in the same manner as previously.

The organisms found at laparotomy (E.coli and Proteus vulgaris) were sensitive to chloromycetin and she was therefore started on this drug. For a time her condition was fair, but she remained hypotensive (100/60 mmHg : P.R. : 100/min.) Her abdominal distension, however, never really disappeared and it subsequently recurred and she once again failed to pass flatus.


The abdomen was opened through an upper left paramedian incision displacing the rectus muscle. Grossly distended coils of small bowel presented. The obstruction was at the wall of the pelvic abscess previously drained, but on this occasion an ill-localised collection of pus which really constituted pelvic peritonitis was present. All adhesions were broken down and in doing so a tear was made in the very friable mesentery. This devitalised about nine inches of small bowel, which was also grossly involved in the inflammatory change. After rapid resection an end-to-end anastomosis was made. The intestine was emptied by suction through the site of anastomosis, and the wound closed with a through and through silk suture and a peritoneal continuous cat gut stitch.

Further blood transfusion maintained a reasonably satisfactory state, but hyponatraemia became more pronounced. She was given 250 mls 5% saline. On 30/11/57 she became dyspnoeic and cyanosed. Bilateral coarse bronchial rales were heard on auscultation and, as she was not sufficiently strong to allow of effective postural coughing, bronchoscopy was necessary. This was followed by a course of intravenous erythromycin. However, by this time her general condition was very poor and over the next twelve hours she deteriorated and finally died.
DISCUSSION.

This patient presents several interesting points for discussion which illustrate some of the post-operative complications which may arise in the management of what initially appeared to be a straightforward case of recurrent biliary obstruction due to stone.

1). Waltman-Walters Syndrome:-

This syndrome, which was recently described in the States, occurs post-operatively following surgery on the biliary tract and is characterised by lower chest pain, tachycardia and a low blood pressure. This triad of clinical features suggests the diagnosis of myocardial ischaemia and this may be further supported by the persistence of ischaemic changes in repeated electrocardiographs. The syndrome is due to an accumulation of bile under the diaphragm which tends to push the liver downwards and medially. The inferior vena cava lies embedded in the posterior aspect of the liver and consequently the venous return to the heart is impaired, with consequent myocardial ischaemia.

In the present case the pain was perhaps not that of myocardial ischaemia, but due directly to the accumulation of bile under the diaphragm (pain in the hypochondrium and referred to the right shoulder). However, this was a tachycardia (from 80 to 110 per min.) and the blood pressure was low (from 120/80 to 90/? mm Hg). A fullness in the right hypochondrium confirmed the presence of an accumulation of bile; in fact, some two pints were removed at operation. This was followed by a considerable improvement in her circulatory state.

The adjacent illustrations, taken from another case demonstrate clearly the profound changes in the cardiovascular system which may result from such an accumulation of bile, and their rapid improvement once the bile was drained. This constitutes a very neat piece of applied physiology.

2). Hepatic Failure:-

Although this patient was not in very good health prior to operation, the appearance of some of the features of hepatic failure was rather unexpected. She developed a painless jaundice inspite of continued bile drainage and became mentally confused. Biochemically there was some evidence of hepatocellular damage, the blood ammonia was slightly raised and the serum sodium was low (see append). Treatment was instituted according to the principles recommended by Sheila Sherlock. The intake of protein was reduced to zero and a high carbohydrate consumption enforced by giving 25% glucose intravenously by canal catheter. Neomycin, an oral antibiotic which is not absorbed, was given in order to reduce to a minimum the formation by intestinal bacteria of toxic nitrogenous substances.
Fig 1. The chart of another patient who had a cholecystectomy and choledochoestomy on 4/4/57 and who subsequently developed the Walter- Waltman Syndrome. The subphrenic accumulation of bile was drained on 8/4/57. Note the profound alteration in the pulse rate and also the rise in blood pressure following drainage.
Fig 2. ECG of 6/4/57 - the second post-operative day.
Sinus rhythm rate = 150 per minute.
PR interval 0.12 of a second.
There are Q waves present in leads II, III and aVF
and subsequent ST elevation and T wave inversion in
lead III and aVF. This is very suggestive of posterior
myocardial infarction.

Fig 3. ECG of 9/4/57 - the fifth post-operative day and the
day after the accumulated bile was drained.
Sinus rhythm now 107 per minute. The Q waves in leads
III and aVF are not now so prominent and the T wave in
lead aVF is no longer inverted. There is now less
evidence to suggest posterior myocardial infarction.
In spite of this fairly energetic treatment no dramatic improvement occurred in her general condition.

3). Pelvic Abscess:

A white count of 38,000 per c.m. with a gross polymorph leucocytosis revealed the cause of her failure to thrive. The fact that she was afebrile merely underlines her poor ability to react to infection. Clearly, then, there was an accumulation of pus somewhere. A subphrenic abscess is a well recognised complication of biliary surgery, and it was logical that this area should be explored first. In fact the abscess was in the pelvis. It is worth noting that this abscess developed in spite of a course of crystallamycin which was started after the drainage of accumulated bile on the first post-operative day. Antibiotics, especially if used routinely, are by no means the answer to surgical infections. The pelvic abscess was drained and, although the organisms were found to be sensitive to chloramphenicol, the use of this antibiotic proved valueless in preventing recurrent intestinal obstruction due to a combination of paralytic ileus and adhesion formation. Her circulatory state could only be maintained temporarily by repeated blood transfusion and she eventually developed hypostatic pneumonia and terminal circulatory failure.
# Biochemical Investigations

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Blood nitrogen 58 mg/100 ml
A CASE HISTORY

of

POST-CHOLECYSTECTOMY SYNDROME

and

CHRONIC RELAPSING PANCREATITIS.
Complaints:- Chest and right abdominal pain with nausea and occasional vomiting for past ten weeks.

History of present illness:-
Sixteen years ago she had her gall bladder removed together with twenty three little yellow stones. She kept to a diet for a subsequent two years and then gave it up. She was symptom-free from this point of view until ten weeks before admission. She had never been jaundiced.

The pain which she had during these last ten weeks was described as aching in character, rather than burning. It started centrally in the chest and then passed along the lower right costal margin towards the back and also down the right side of the abdomen. At the beginning of an attack the pain gradually built up and thereafter was more or less constant in severity until it finally gradually subsided again. An attack could last as short a time as half an hour, or for as long as nine hours, and not uncommonly came on at night on lying down. Stooping or bending down, however, did not aggravate the pain. The severity of the pain was difficult to assess.

She also experienced pain in the back, but on further questioning this pain appeared to be quite distinct from the abdominal pain, being related to sitting for a long time in one posture.

She claimed to have had heartburn in the past, but not now. No attempt had been made by her to find something to relieve the pain. She had no difficulty in swallowing.

Nausea and vomiting:— The abdominal pain was generally associated with nausea and anorexia. She used to vomit once or twice a week, the vomit being bilious in nature or consisting of the last meal. She had some increased flatulence during the last few weeks.

Appetite:— Fair. For a long time she avoided fries, but about six months ago she was put on a diet while being treated for a respiratory infection in the Northern Hospital, Dunfermline.

Weight:— She lost about six pounds during the last few months.

Bowels:— Motions of normal colour. Occasional diarrhoea, and occasionally took medicine for constipation.

Urine /
Urine:— Normal in colour and volume. There was some discomfort before passing water. She had considerable itch.

Personal Health:—

No cough or sputum.
Not unduly breathless since her respiratory infection was controlled.
No ankle swelling.
Menopause at 49. No discharge since.

Past History:—

(1). When a school girl she had pain in left knee, diagnosed as hip joint disease, and treated by raising the heel and sole of right foot and walking on crutches for four months.
(2). Also as a school girl she had an abscess in left side of neck which burst and healed spontaneously.
(3). Left kidney removed in Edinburgh Royal Infirmary 1937 on account of an "abscess" associated with severe urinary symptoms - frequency, dysuria.
(4). Cholecystectomy 1940.
(5). Appendectomy 1953.
(6). Operation on account of severe headache coming from left frontal sinus. She now has occasional headaches from right sinus if she has a cold, and is attending Ear Nose and Throat department at Dunfermline. Next appointment January 1957.
(7). Apparently she has had a chronic respiratory infection since May 1956, and was admitted to Northern Hospital, Dunfermline, eight weeks ago for five weeks. Since her discharge there have been no significant respiratory symptoms.

No rheumatic fever.

Family History:—


Mother (80) Osteoarthritis. Gall-bladder symptoms at one time.

Deceased  Father (50) Diabetic and pleurisy, died 25 years ago.
Social History:

She lives with sister and mother in a good comfortable house, is a non-smoker and teetotal.

On Examination:

A healthy looking woman except for being moderately overweight. The mucous membranes were well injected.

Alimentary System:

The tongue was clean and moist, and the breath was not offensive. Dentures.

Abdomen: Moderately obese. Hernial orifices normal, operation scars - Appendectomy
Right paramedian
Left transverse.

Palpation: Soft, with no guarding or any marked tenderness, but slightly tender in epigastrium.
Murphy's and Boa's sign negative.
The liver, spleen and kidney were not palpable.

Percussion: Confirmed the absence of hepatomegaly or splenomegaly.
Gall bladder impalpable (Cholecystectomy).
No abnormal masses detected.

Rectal examination: No evidence of piles and sphincter tone is normal. No undue tenderness present, no abnormal masses detected.
Stool benzidine negative Ham.

Respiratory System:

Trachea central.
No axillary lymph glands.

Chest: Symmetrical in form; expansion moderate and equal.
Percussion note was resonant and equal throughout.
Breath sounds vesicular in all areas.
Crepitations at right base. No rhonchi.
Vocal resonance normal and equal throughout.

Cardio-vascular System:

Radial Pulse: 80/min. regular, normal in character.
Vessel wall not palpable.

Blood Pressure: 130/80 mm Hg.
Apex beat not palpable.
palpable.

Heart sounds were faint in mitral area, but clear and closed elsewhere. There were no murmurs.
Jugular veins were not engorged.
No sacral or ankle oedema.

Nervous System:–

She was alert and co-operative. Her intelligence as a witness was average.
Pupils were circular, central and equal, and reacted physiologically to light (direct and consensual) and accommodation.
Cranial nerves were tested individually and all found to be intact.

Reflexes:–

Biceps Triceps Supinator Knee Ankle Abd. Plantar Resp.
L + + + + + + +
R + + + + + + +

No motor or sensory impairment.

Provisional Diagnosis. Biliary Colic.
CLINICAL DIAGNOSIS.

Here is a patient with a history of cholecystectomy sixteen years ago who complains of a non-colicky pain that started in the chest and then radiated along the lower right costal margin towards the back and down the right side of the abdomen.

The origin in the chest makes it necessary to include coronary insufficiency in the differential diagnosis; but she had been having recurrent attacks during the previous ten weeks which were quite unrelated to exertion. She had none of the symptoms of cardiac failure, and there was no sign in the examination to suggest a cardiovascular disorder. The subsequent radiation of the pain down the right side of the abdomen towards the right iliac fossa would be unusual for one of cardiac origin.

I am not aware of the details of her respiratory complaint which required her admission to the Northern Hospital, Dunfermline, but it is difficult to conceive how any pulmonary pathology could explain the clinical picture. The pain was independent of respiration and was not distributed in a clearly segmental manner. An intra-abdominal cause must therefore be sought.

There is the possibility of peptic ulceration. While the pain was intermittent it was not related to meals, and it lacks the characteristic sharp localisation of a peptic ulcer pain. Although there was a previous history of heart-burn this had not recurred for many years. The non-colicky nature of the pain rules out an intestinal obstruction, but the diagnosis of chronic relapsing pancreatitis is perhaps not so readily excluded. Vomiting was a feature and the pain was typically epigastric, central and radiated through to the back. The pain under consideration, however, did not seem to have the characteristic boring quality which is frequently associated with chronic pancreatitis. Moreover, the duration of the attacks was a matter of a few hours and could be as short as half an hour before they ended spontaneously; the pain of chronic relapsing pancreatitis is usually measured in days. Finally, in spite of a ten week history there was no evidence of steatorrhoea.

By and large the features of the pain correspond fairly well with those associated with classical biliary colic. Indeed the only abnormal features are that the pain started in the chest and that she did not have a gall-bladder. There was no objective clinical evidence in the form of jaundice, pale stools and dark urine to confirm the presence of biliary obstruction. A fibrous stricture of the biliary passages or a carcinoma of the head of the pancreas or of the ampulla of Vater would be expected to give rise to jaundice at least at some stage. The stool benzidine was negative. Cholangitis is excluded as she was afebrile. By process of exclusion, therefore, she could either be suffering from distension of the common bile duct by stones without sufficient obstruction to cause jaundice, or she may be subject to the cystic duct syndrome consequent upon ligation of the cystic duct too far distal from its junction with the common hepatic duct at the previous cholecystectomy.

Intravenous /
Intravenous cholangiography was done and this showed the common bile duct to be grossly dilated and packed with several fairly large translucent stones. In spite of this the dye entered the duodenum (as expected on account of the absence of jaundice). The operation of choledocholithotomy was clearly indicated. Serum electrolytes and proteins, liver function and prothrombin activity were determined before operation and all found to be within normal limits.

**Surgical Management.**

28/12/56

Pre-operative Diagnosis:— Choledocholithiasis.

Post-operative Diagnosis:— The same.

Operation:— Choledochostomy, Choledocholithotomy.

Path Findings:— At the operation the common bile duct was found to be moderately dilated. A total of sixteen stones were removed from the common bile duct; two of these were from the right hepatic duct and four from the left hepatic duct. An operative cholangiogram showed what could be taken to be two remaining stones in a branch of right hepatic duct and therefore inaccessible.

Operation Procedure:—

The abdomen was opened through a Mayo-Robson incision over the old scar. On opening the peritoneal cavity a few adhesions were found between the liver edge and peritoneum, and between stomach and peritoneum. These were easily divided by means of sharp and blunt dissection.

The common bile duct was easily identified and stones within it palpated. A small area of the anterior wall was cleared and with stay sutures in place an incision about 1cm in length was made in the duct. On opening the duct a large stone presented at the orifice. The stones were then removed from the right and left hepatic ducts and finally from the distal common bile duct. In all sixteen moderate-sized faceted, cholesterol stones were removed from the dilated biliary passages. The common bile duct was then probed and dilaters passed easily into the duodenum. Transduodenal sphincterotomy was not performed. A catheter was then inserted and the incision in the common bile duct was closed with continuous catgut on an atraumatic needle. An operation cholangiogram showed dilatation of the ducts with small translucent areas in the intrahepatic ducts and common hepatic duct. It was difficult to decide whether these translucencies represented air, mucus or retained gall-stones.
The peritoneum was closed with continuous catgut after a rubber drain had been inserted. The anterior sheath was closed with continuous catgut and the skin edges were opposed with Michel clips. Four tension sutures were inserted. Drain:— one rubber and one tube.

Duration:— Ninety minutes.

Post-Operative Progress.

1. Early. On the second post-operative day she was found to be febrile with dullness on percussion of the right lung base with diminished air entry. A chest X-ray was negative, but this cannot be said to contradict the clinical diagnosis of a post-operative chest with partial collapse. The chief factor responsible for this complication was the presence of pre-existing respiratory disease—a chronic respiratory infection since May 1956. "Crystomycin" was given as a prophylactic measure to allay or prevent infection spreading into a bronchopneumonia with lung destruction. This seems rational, but according to some workers (e.g. Dudley "Principles of Surgical Management" 1958) "there is little evidence that antibiotics have any influence on the course of post-operative chest complications and they should not be used as a routine prophylaxis or in treatment". There is no doubt, of course, that the mainstay of treatment is to dislodge and cough up the obstructing mucus, and the efficient help of a physiotherapist was recruited to achieve this.

Her further convalescence was delayed by persistent vomiting. This is difficult to explain. The border line between intestinal flatulence and paralytic ileus is not clear. Abdominal distension was not a marked feature at any stage and a straight X-ray abdomen on the third post-operative day showed no undue gaseous distension of the bowel. A Ryle's tube was passed very shortly after the vomiting started so that the full picture of repeatedly vomiting mouthfuls in an effortless manner together with abdominal distension and the typical X-ray appearance of multiple distended coils of small intestine with fluid level was not seen. It is generally agreed that peristaltic stimulants (such as neostigmine, carbachol, etc) have no place in the treatment of paralytic ileus. Too often they activate only the comparatively less affected jejunum and force more gas and some fluid into the paralysed ileum, with the result that the distension increases and a greater length of small intestine becomes totally paralysed.

Paralytic ileus, however, is not the whole explanation; she continued to vomit in spite of the return of good bowel sounds and she passed flatus. It is also interesting to note that in later stages neither the gastric aspirate nor vomit were bile stained. Reference to the fluid balance charts shows that the vomiting may be correlated with reduction in drainage through the T-tube, suggesting that an underlying factor was some blockage in the T-tube.
Fig 1. Operative Cholangiogram

Fig 2. Post-operative Cholangiogram.
Liver function as indicated by the serum proteins and thrombin activity was definitely depressed. A damming back of bile would also explain her vague abdominal pain, but in the absence of jaundice the blockage must only have been a mild one.

A post-operative cholangiogram via the T-tube on the tenth post-operative day showed no calculi. The translucencies noted in the operation cholangiogram must have been due to air or mucus. Surgical opinion differs about the value of operation cholangiography; McNeill Love (1952) considers it essential; Maignot (1952) thinks it cumbersome and unnecessary. Certainly the present example proves that it is not altogether reliable.

In order to ascertain if bile would flow into the duodenum the T-tube was clamped for a short period on the eighth post-operative day and for longer periods on successive days. Since no bile drained around the tube and the patient experienced no pain at that time it was assumed that an adequate track existed. In addition it was demonstrated radiologically that dye in the biliary system could pass into the duodenum. On the eleventh post-operative day the tube was removed and the profuse soakage of bile showed that a track had formed around the stem of the T-tube shutting it off from the peritoneum.

She was discharged home after four weeks convalescence.

2. Late.

Since discharge in January 1957 she had no abdominal complaints but was prevented from returning to work on account of her chest.

8/5/57: Re-admitted to Northern General Hospital on recommendation of Prof. Crofton.

13/5/57: Shortly after getting out of bed and walking round the ward at 6am. she suddenly had a severe pain in the chest. This pain, which was "constant and gripping" in character started in the centre of the chest. She felt dizzy and nauseated. Two hours later the pain was still severe although somewhat better. The pain had spread diffusely in the abdomen and was no more severe on the one side or the other. She attributed the pain in the small of the back and the left scapular region to lying motionless in bed. At no time did the pain radiate into the arms or up into the neck. The pain persisted unabated and she vomited copiously on four occasions starting at about 1am. the following morning. She passed no flatus. The pain persisted until relieved by an injection of 15 mg of morphine twenty three hours after its onset.

On Examination:

- Pale, slightly cyanosed, but not jaundiced.

Alimentary System:

- Tongue furred and dry. Hernial orifices intact.
- Abdomen diffusely tender with marked guarding. Tenderness maximal on right side.
side. No free fluid. Liver, spleen and kidneys were not palpably
enlarged. Abdomen normally resonant. Bowel sounds absent. Rectal
examination showed no tenderness or other abnormality.

Cardiovascular System:—

Pulse = 130/min., regular.
B.P. = 140/90 mm Hg.
Heart sounds moderate in intensity, clear and closed in all
areas without abnormal accentuation. No pericardial friction
rub. No evidence of cardiac failure.
Fundii normal.

Respiratory System:—

Course crepitations at left base but no detectable bronchospasm.

Nervous System:—

No abnormality.

It is interesting to note that the pain of this last attack
started in the chest and gave rise to much confusion with the pain
of myocardial ischaemia. Reference to her previous history shows
that her biliary colic pain started in exactly the same manner, but
the subsequent character of the episode of abdominal pain was unlike
anything she had experienced before. An E.E.G showed sinus rhythm,
lengthening of the QT interval and other non-specific changes which
could have been due to anoxia, ischaemia or to hypokalaemia.

Chest X-ray was negative and a straight X-ray abdomen was also
negative except for marked gaseous distension of the small intestine.
The serum amylase was 2 Wolgemuth units/ml some 24 hours after the
onset of the pain. The urine was negative.

With the development of generalised upper abdominal rigidity
and some epigastric tenderness it was felt that laparotomy was
indicated. The incision was made in the line of the old Mayo-Robson
incision. There was no free fluid in the abdomen. The small intestine
was collapsed and the stomach, small intestine, colon, appendix and
ovaries all appeared normal. No stones could be palpated in the bile
duct with certainty, but a small hard mass was palpable in the head
of the pancreas. The pancreas showed generalised thickening. There
was no fat necrosis. The abdomen was then closed.

It was obviously important to know the nature of the pancreatic
pathology. Prolonged pain, shock and a silent abdomen was compatible
with acute pancreatitis, but at laparotomy there was no free fluid,
no fat necrosis and the pancreas did not appear haemorrhagic or even
edematous. The appearance at laparotomy was more in keeping with
a chronic pancreatitis. A "biligrafin" cholangiogram showed a similar
degree of narrowing at the lower end of the common bile duct as that
noted several months previously. No calculi were seen with certainty.
The following investigations were subsequently carried out:—
(see appendix for details).

Fat balance test = 98% absorption.
Faecal nitrogen excretion = normal.
Glucose tolerance curve = diabetic.
The provocative secretin test, using morphine and secretin, was strongly positive (serum amylase rising from 8 to 66.7 units).
Serial E.C.G's showed no evidence of myocardial infarction.

The investigation of pancreatic function, therefore, confirmed the provisional diagnosis of chronic relapsing pancreatitis.

Course and Treatment.

Laparotomy was followed by recrudescence of her bronchitis, which settled on treatment with physiotherapy and crystamycin. On the seventeenth post-operative day she had a left pulmonary embolism from deep venous thrombosis of the legs. This was treated with anticoagulants and a course of terramycin. On the twenty-sixth day of her admission a further episode of severe pain occurred during which an E.C.G. and serum amylase were normal.

Once the diagnosis of chronic relapsing pancreatitis had been confirmed, the attacks of pain were treated with morphine, atropine, "crystamycin", and only fluids by mouth (for rationale see later). Between attacks this patient remained well and never showed any signs of intestinal malabsorption. Consequently, long-term changes in her diet or replacement of pancreatic exocrine secretion with enteric-coated "pancreatin" tablets were not required. Her diabetes was latent rather than overt. However, it is possible that there is an obstructive basis to her pancreatitis and which might be relieved by a sphincterectomy. Splanchnicectomy might be done to relieve her recurrent attacks of pain. These two possibilities were put to her, but she was unwilling to contemplate any further operation in the near future.

Over the subsequent eight months her general health was much improved and she gained weight, and had only one attack of severe abdominal pain. This pain started high in the epigastrium and across both rib margins, and later radiated to the left posterior thoracic area. It lasted for an hour with some variation in intensity. There was no associated vomiting. Apart from that one severe attack she has had recurrent minor epigastric discomfort in the form of fairly constant "tight feelings and aching" in the epigastrium, which tend to come on either on first lying back in bed or after meals. A barium meal excluded the presence of a hiatus hernia, and it is clear that most of these symptoms are the result of minor recurrent attacks of low grade pancreatitis.
1. Post-Cholecystectomy Syndrome.

The term "post-cholecystectomy syndrome" is used to denote symptoms referable to the biliary tract which persist or recur after cholecystectomy. The concept emanated from the continent and U.S.A. that this might be due to spasm of the sphincter of Oddi. The general consensus of opinion in this country, however, is that when symptoms do occur there is nearly always an organic reason for them. So it is in this case; sixteen faceted cholesterol stones were removed from the dilated biliary passages.

In this country stones in the common bile duct is the commonest aetiological factor in the post-cholecystectomy syndrome. The question arises as to how these stones got there. Although this is largely a matter of conjecture, it is likely that in the majority of cases stones have been left in the common bile duct at the previous operation — in this instance, the cholecystectomy in 1940.

Stones may also come down from the intra-hepatic ducts after operation. Such calculi may certainly increase in size but it is doubtful if they actually form in the common bile duct after cholecystectomy. During the operation of cholecystectomy the common bile duct is not explored routinely by some surgeons and according to the Edinburgh School should not be opened unless one of the following indications is present:

1. Any previous history of jaundice.
2. Where the common bile duct is obviously dilated.
3. Where there is evidence of cholangitis.
4. When something can be felt to be contained in the bile duct.
5. When the gall bladder is full of small stones and the cystic duct is wide, or
6. Where there is associated pancreatic inflammation.

Yet stones may be present in the common bile duct in spite of the absence of all these signs. Even when the common bile duct is opened stones may be quite easily missed because the very act of manipulation may shoot them up out of reach into the hepatic ducts.

In recent years the technique of operative cholangiography has been devised in an attempt to detect stones remaining in the biliary passages. Ten ml. of 35% diodine is injected rapidly down a small ureteric catheter which is passed through the cystic duct down into the common bile duct for about 4cm. During the operation of choledocholithotomy on this patient an operative cholangiogram was performed. Just how unreliable this method can be was proved in the present case. As mentioned earlier the operation cholangiogram showed translucencies in the hepatic ducts which looked for all the world like stones and yet they were subsequently proved to be only mucus or air.

The /
The latest device is an electronic gall stone detector which can be introduced into the biliary passage, but whether this will in fact have any great practical value remains to be seen.

Post-cholecystectomy symptoms may also be caused by stones lying in the cystic duct stump, and there is also evidence that a dilated cystic duct stump may be responsible for symptoms (Don & Campbell, 1956). Although such a stump was not demonstrated in the intravenous cholangiogram a moderate cystic duct stump was nevertheless seen in the post-operative cholangiogram. The relative significance of this is difficult to assess.

2. Chronic Relapsing Pancreatitis.

The previous history of gall-bladder disease is noted as probably being of aetiological significance. About half of all cases of chronic relapsing pancreatitis have coincident gall-bladder disease. The patients are not usually very obese and more than half of them are addicted to alcohol, and very often alcohol incites an attack. This patient claimed to be teetotal. The disease is quite uncommon in Britain.

A battery of biochemical tests are now available for the investigation of both the exocrine and endocrine functions of the pancreas.

The cause of an acute attack or a relapse in chronic pancreatitis is still obscure, but the simplest view is to regard the inflammatory changes that occur in the gland as being due primarily to the liberation of pancreatic enzymes. This liberation occurs when the gland is actively secreting and the duct, for some reason, is blocked. Depending on the secretory pressure and the completeness and duration of the obstruction, different degrees of pancreatitis will be produced varying from transient oedema which subsides completely, to the full-blown picture of haemorrhage, necrosis, gangrene and sloughing with subsequent bacterial invasion. Such severe inflammation is always accompanied by considerable shock. If this view of the aetiology of pancreatitis is accepted, a rational plan of treatment can be prescribed.

Morphine was used to allay the severe pain, but it has the disadvantage that it constricts the sphincter of Oddi and thus tends to raise the secretory pressure within the pancreas. Atropine (1mg SC) tends to inhibit the exocrine secretion of the pancreas, and in this way it counters the effect of morphine, but it will also tend to increase further the constriction of the sphincter of Oddi. Glyceryl trinitrate, 0.5mg, sucked under the tongue every half-hour may be effective in relaxing the sphincter of Oddi, but it may also cause further circulatory imbalance in the shocked patient. It was not used in the present case.

A further attempt was made to reduce the secretion of pancreatic enzymes by restricting oral intake to fluids only and thereby cutting
down the release of the secretory hormones, secretion and pancreozymin, to a minimum. Meantime the patient was fed parenterally with 5% glucose.

Though the immediate cause of the inflammation of the pancreas is due to acute digestion, this may be followed by bacterial invasion; consequently, a course of penicillin and streptomycin was given prophylactically.

As she was not keen to have a further operation to relieve the obstruction at the sphincter of Oddi, there was little that could be done in terms of general maintenance treatment. Her progress will have to be followed indefinitely, but in the meantime any acute exacerbations that arise can be treated symptomatically along the above lines.

**Final Diagnosis.**

Post-cholecystectomy syndrome due to the accumulation of numerous cholesterol stones. Subsequently shown to have coincident chronic relapsing pancreatitis.
### APPENDIX

#### Biochemistry Reports

**Serum Amylase:**
- **14/5/57 1.35 p.m.** 1.35 Wohlgemuth units/ml.
- **10/6/57 During pain** 6.7 Wohlgemuth units/ml.

**Provocative Pancreatic Test:**

<table>
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<th>Date</th>
<th>Tube</th>
<th>Vol. mls.</th>
<th>Amylase units/ml.</th>
<th>Icteric Index</th>
<th>Co. content Vols % mEq/L</th>
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</thead>
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<td></td>
<td></td>
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<tr>
<td><strong>Gastric</strong></td>
<td>1</td>
<td>17</td>
<td>Nil</td>
<td>80</td>
<td>10 - Pre-secretion</td>
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<tr>
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<td>2</td>
<td>14</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>19</td>
<td>Nil</td>
<td>60</td>
<td>10 - Post-secretion</td>
</tr>
<tr>
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<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>17</td>
<td>Nil</td>
<td>10</td>
<td>10 - Post-pancreozymin.</td>
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<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>12</td>
<td>0.2</td>
<td>200</td>
<td>10 Pre-secretion</td>
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<tr>
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<td>2</td>
<td>13</td>
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<tr>
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<td>3</td>
<td>14</td>
<td>0.4</td>
<td>120</td>
<td>32 14 Post-secretion</td>
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<tr>
<td></td>
<td>4</td>
<td>14</td>
<td>0.2</td>
<td>240</td>
<td>Approx.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>2</td>
<td>0.2</td>
<td>240</td>
<td>Approx. 22 10 Post-pancreozymin</td>
</tr>
</tbody>
</table>

**Serum**
- **(1) Pre-secretin** Amyle 8 units
- **(2) Post-secretin** 25 mins. Amylase 8 units, Bilirubin insufficient
- **(3) Post-secretin** 60 mins. Amylase 86.7 units, Bilirubin 0.3 mg/100 ml.
- **(4) Post-pancreozymin.** Amylase 40 units, Bilirubin insufficient.
24/5/57 Glucose Tolerance Test. - Plasma glucose. (From capillary blood)

Fasting (0 min.) = 147 mg/100ml
30 min = 207 mg/100ml
60 min = 260
90 min = 293
120 min = 240
150 min = 203
180 min = 153

10/6/57 Fat Balance Test:

Dietary rejects = Total Fat (as Stearic Acid) = 3.6 G.
3 day stool = Total Fat (as : : : ) = 2.1 G.
Total intake = - - - - - - - - -146 G.
Absorption = 98%.

10/6/57 Total stool nitrogen (3 day stool) = 1.6 G.
Biochemistry Report:

23/12/56
Serum electrolytes
Sodium = 330 mgm/100 mls or 143 meq/l
Potassium = 16.8 mgm/100 mls or 4.3 meq/l
Chloride (as Na Cl) = 606 mgm/100 mls or 104 meq/l
Carbon dioxide combining power = 54 vols.% or 24 meq./l

Serum Proteins
Total = 6.30 G/100 mls
Albumin = 3.70 G/100 mls
Globulin = 2.60 G/100 mls

26/12/56 Prothrombin activity = 100%.

27/12/56 Alkaline Phosphates = 8 units K & A.
serum bilirubin = 0.2 mgm/100 mls
thymol turbidity = 6 units
cephalin-cholesterol flocculation = negative.

31/12/56 Serum electrolytes
Sodium = 360 mgm/100 mls or 156/1 meq/l
Potassium = 17.1 mgm/100 mls or 4.4 meq/l
Chloride (as NaCl) = 570 mgm/100 mls or 98 meq/l
Carbon dioxide combining power = 54 vols.% or 24 meq/l

3/1/56 Serum electrolytes
Sodium = 340 mgm/100 mls or 147 meq/l
Potassium = 17.9 mgm/100 mls or 4.6 meq/l
Chloride (as Na Cl) = 554 mgm/100 mls or 95 meq/l

Proteins:
Total = 6.3 G/100 mls
Albumin = 2.9 G/100 mls
Globulin = 3.4 G/100 mls

Prothrombin activity = 63%.
A CASE HISTORY

CARCINOMA of THE HEAD OF THE PANCREAS.

The patient first became aware of a constant dull pain in the region of the umbilicus during the second week of May. This type of pain was present on arising in the morning, increased on sitting up in bed, and was present during the night. The patient lost about five pounds in weight. He noticed his appetite was not as good as normal

The pain was not relieved by food, and was not in any way affected when he smoked. He had no change in his bowel habits. The pain was not relieved by taking antacids. He was not bothered by frequent urination or dysuria. His general health was good, and he stated that he had been in good health all his life.

There was no history of a family history of any other cases of this nature. The patient had no history of any other symptoms that had never been present before.
Name :- Mr A.S. (69)
Occupation :- Joiner
Referred by his own Doctor.
Admitted :- 17/8/57

HISTORY.

Complaints:-
Upper abdominal pain, anorexia and marked weight loss during the past four weeks.
Dark urine, pale stools, skin irritation and jaundice also for about four weeks.
Indigestion for two weeks.

Present History:-
This patient first became aware of abdominal pain while on holiday during the second week of July of this year. The pain came on at night, started in the right hypochondrium and radiated right across both sides of the abdomen. The pain was dull and constant in character. About four days later he noticed that his skin was extremely itchy and that he was rapidly becoming deeply jaundiced. At about the same time as the abdominal pain started, he noticed his motions were practically white in colour and that soon afterwards his urine became very dark.

He called in a doctor and was given a medicine without much effect. A week later when the pain gradually eased off, and that particular pain did not recur, his motions occasionally showed a little brown colouring but mostly remained white. His water was persistently dark. The itch eased off and his jaundice became less marked.

Since the onset of jaundice his appetite was poor and he lost much weight. About a fortnight before admission he began to get indigestion with epigastric pain about an hour after meals. The pain was different from the previous one; it was boring in character and radiated across the lower chest and sometimes up into the neck. The pain was not influenced by posture. He felt nauseated but did not actually vomit. He took nothing to relieve the pain and did not know what effect food might have. He subsequently developed a little heart-burn, but no flatulence.

His bowel habit remained at once or twice a day, but during the past four weeks the motions were very bulky and unformed with an offensive odour. Some degree of polyuria and frequency which he developed recently seems to be related to an increase in the amount of water drunk. He has had slight burning dysuria and the urine has had a strong smell.

There is no undue breathlessness on effort, no angina, no swelling of the ankles. He has had an occasional cough productive of grey sputum that has never been blood stained.

On Examination /
On Examination:

Alimentary System:

The abdomen was protuberant and quite tense, with slight tenderness in the right hypochondrium. The liver could not be definitely palpated but there was a definite tenseness to 2 fingers' breadth below the costal margin and a change on percussion at this point. The gall bladder was not palpable. There was no splenic enlargement detectable on palpation or percussion. The bowel was somewhat distended and hyper-resonant on percussion and there was some shifting dullness in the flanks. Succussion negative. No masses were felt. No rebound tenderness. Bowel sounds present. Rectal examination negative. Stool Ham negative.

Cardiovascular System:

Pulse 80/min. regular in time and force except for an occasional extra systole.

B.P. 150/90 mm Hg.
No jugular venous engorgement.
Apex beat: diffuse.
Heart sounds: both sounds heard in all areas with no abnormal accentuation and no murmurs. No evidence of thrombophlebitis.

Respiratory System:

Breathing normal in rate and character.
Chest symmetrical in form and movement. Expansion moderate.
Percussion note hyper-resonant with some reduction in areas of cardiac and hepatic dullness.
Breath sounds vesicular with a few scattered rhonchi, but no crepitations.

Central Nervous System:

Cranial nerves intact.
All reflexes very weak but equal.
Motor power good.
No gross sensory loss.
CLINICAL DIAGNOSIS.

The most striking feature of this man's case is the presence of an obstructive type of jaundice for about four weeks. His skin was deeply jaundiced, his motions were "practically white" and his urine dark. Although there is some history of a slight lessening of the depth of jaundice with a little colouration of the stool, on the whole it would be fair to describe this biliary obstruction as unremitting.

The associated abdominal pain was initially dull, constant and non-colicky in character; but this was subsequently replaced by a "boring" pain in the epigastrium, typically of pancreatic origin.

When these two features are put together - unremitting obstructive jaundice and the history of a pancreatic type of pain - a fairly confident diagnosis of a lesion in the head of the pancreas can be made. This lesion might be carcinoma of the head of the pancreas, a chronic pancreatitis or possibly a biliary calculus impacted near the ampulla of Vater. The absence of any previous history of dyspepsia tends to refute the diagnosis of chronic pancreatitis. Previously silent gall-stones may suddenly proclaim their presence by impacting in the common bile duct, but then the jaundice so produced is usually of a remitting type and associated with biliary colic.

It is not true to say that malignant obstruction produces invariably a painless jaundice. Berk found pain at some time in the course of three-quarters of his cases of cancer of the pancreas, and often severe initially. Bourne has reported three cases in which pain was for long, in one case for two years, the only symptom. Not only is this true for cancer of the pancreas but also, to a less extent, for cancer of the papilla, ampulla and common duct. However, as in the present case, the pain of malignant jaundice is seldom a colic. In the presence of jaundice, according to Courvoisier's Law, the gall-bladder of an obstructive jaundice due to pancreatic neoplasm is enlarged and palpable while the small fibrotic gall-bladder associated with obstructive calculi and chronic cholecystitis is impalpable. In the present case the gall-bladder was not palpable and it is difficult to know just how much reliance should be placed on this negative sign.

The tumour may not necessarily be in the head of the pancreas, although that is the most likely place. There may be a tumour in the duodenal papilla, ampulla of Vater or even the common bile duct itself. The stool Ham was negative.

The differential diagnosis at this stage is in any event somewhat academic. The important and incontrovertible fact is that this patient had prolonged severe obstructive jaundice with little chance of a spontaneous remission. Further medical treatment could only result in liver damage leading ultimately to hepatic coma and death. It was essential to relieve the obstruction to the bile tract by surgical means. The patient was therefore transferred to a surgical ward.
PROGRESS and MANAGEMENT.

In the presence of jaundice cholecystography could not be carried out. A straight X-ray of the abdomen showed several calcified opacities near the right transverse process of the fifth lumbar vertebra, also to the left of the third lumbar vertebra. These had the appearance of calcified glands and no opaque calculus could be seen in the gall-bladder area.

The serum biochemistry on the day following admission was:

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum bilirubin</td>
<td>7.6 mg/100 ml.</td>
</tr>
<tr>
<td>Alkaline phosphatase</td>
<td>54 units (checked)</td>
</tr>
<tr>
<td>Thymol turbidity</td>
<td>2 units</td>
</tr>
<tr>
<td>Plasma albumin</td>
<td>3.0 G/100 ml.</td>
</tr>
<tr>
<td>Plasma globulin</td>
<td>3.9 G/100 ml.</td>
</tr>
<tr>
<td>Plasma N.P.N.</td>
<td>26 mg./100 ml.</td>
</tr>
</tbody>
</table>

These findings confirm the obvious clinical diagnosis of extra-hepatic obstructive jaundice and show in addition that there had been no gross liver damage.

The prothrombin activity on admission to the surgical ward was 74%. This was corrected pre-operatively by oral vitamin K ("Synkavit") 100 mg daily. Three days later the prothrombin activity was 100%.

During the ten days in hospital prior to operation he developed some abdominal distension due to ascitic free fluid, which was demonstrated by the presence of shifting dullness.


Anaesthesia - General.

The abdomen was opened through a Mayo-Robson incision and the peritoneum was found to contain nine pints of dark brown bilious fluid. The gall-bladder was enlarged and distended with bile, and the common bile duct was enlarged to twice its normal diameter. There appeared to be some induration in the head of the pancreas but no very obvious mass. The right lobe of the liver was covered on its surface, especially the right lateral surface, with a mottled white appearance. All the intra-peritoneal tissues - gut, stomach, intestines - were friable, congested and stained a very dark green. There were some hard but mobile glands in the mesentery of the small bowel.

The gall-bladder was emptied by trocar and canula with suction and was found to contain thick bile similar to the peritoneal content. There were no stones present. The common bile duct was opened between stay sutures and it likewise contained thick bile but no stones. A bougie passed freely downwards along the common bile duct and appeared to meet with no obstruction. The duodenum, however, was not opened.

The peritoneum was closed after performing cholecystostomy /
Figure 1. The appearance of the intestine and mesentry at operation.
(Figure 2. Operative Cholangiogram.)
cholecystostomy and invaginating the tube. The common bile duct was closed around a T-tube with a continuous catgut stitch and both the T-tube and the cholecystostomy tube were brought out through the main wound.

A cholangiogram (see fig. 2) was then performed. The dye filled the distended bile passages but no dye entered the duodenum. As already mentioned, however, all the intraperitoneal structures were very friable and it was therefore considered inadvisable to attempt any more radical surgery at that time beyond simply relieving the biliary obstruction. The wound was therefore closed in layers about the drains.

Over the next fortnight he remained comfortable and bile drained adequately from the choledochostomy but not from the cholecystostomy. Even when the choledochostomy tube was clipped for an hour there was no drainage through the cholecystostomy. The icterus and jaundice slowly improved. The serum bilirubin fell from 7.6 mg/100 mls to 3.3 mg/100 mls and the alkaline phosphatase from 54 units to 29 units.

17/9/57. Operation

Anaesthesia - General.

The abdomen was re-opened through the previous Mayo-Robson incision and the abdominal contents were found to be in a more healthy condition than at the first operation. A small firm mass was palpable in the head of the pancreas and diagnosed as carcinoma of the head of the pancreas.

In spite of earlier difficulty in establishing drainage through the cholecystostomy a cholecysto-duodenostomy was performed. The T-tube was left in situ.

Two pints of blood were given post-operatively.

Bile subsequently continued to drain freely via the T-tube and the patient remained comfortable. Two to three weeks later the T-tube was clipped for increasing periods 8 hours, 13 hours, 3 days. The patient had no pain and the T-tube was eventually removed. A cholangiogram later showed gross dilatation of the common bile duct with obstruction at the ampulla and pressure deformity of the terminal half inch, consistent with a carcinoma of the head of the pancreas. Contrast medium passed through the cholecysto-duodenostomy stoma, though most of it was pooled within the common bile duct, probably as the result of the normal valves in the gall-bladder neck. The cystic duct was well outlined but it was thought that there must be some form of obstruction in the common hepatic duct as this structure received only a small quantity of the contrast.

Apart /
Apart from a slight discharge from the wound this patient did very well post-operatively and went home on 18/10/57 free from jaundice. Two weeks later the wound was still open, but granulating satisfactorily. After a further two months he was again very well.
DISCUSSION.

Diagnosis.

The operative findings excluded the presence of stone, but a definite diagnosis of carcinoma of the head of the pancreas could not in fact be made. It remains possible, although rather unlikely, that this patient has a chronic pancreatitis. Any evidence of fat necrosis at laparotomy would have been well masked by the gross bile peritonitis. There is no histology to prove the presence of carcinoma of the pancreas, but the subsequent progress of the patient will no doubt decide.

In accordance with Courvoisier's law the gall-bladder at operation was in fact found to be dilated. Only in 2 per cent cases of biliary obstruction due to tumour is the gall-bladder not enlarged, and in these, either the obstruction is above the junction of the cystic and common hepatic ducts or else the gall-bladder is coincidentally the seat of stone or inflammation and contracted by fibrosis.

It is virtually impossible to decide clinically the precise site of a cancer which produces biliary obstruction. The presence of occult blood in the stool, or in the duodenal content aspirated by Ryle tube, is suggestive of an ulcerating tumour of the papilla or ampulla, but it also sometimes appears in tumours of the extrahepatic ducts, and rarely in cancers of the pancreas. With a negative stool Ham one cannot draw any conclusions on that score alone. The early ascites noted in this patient with marked bile peritonitis might suggest a tumour of the common duct rather than of the ampulla or pancreas.

There was no evidence of metastases either to the liver or to the regional lymph nodes. In this respect carcinoma of the head of the pancreas is more favourable than a carcinoma of the body or tail.

Treatment.

As already mentioned the treatment for this patient could only be surgical; there is no place for medical procrastination in prolonged unremitting extrahepatic obstructive jaundice. Initially, in the presence of diffuse bile peritonitis and friable gut simple drainage of the biliary system was indicated and effectively performed. With pressure relieved from the liver parenchyma, the gut in a healthier state and the patient's general condition much improved, it was then possible to consider in more detail what the further management should be. This would either be radical in the attempt of achieving a "cure" or palliative.

The operation of pancreatico-duodenectomy for the treatment of cancer of the head of the pancreas is now well established as the result of the work of Whipple, Illingworth, Maignot, Hunt, Gordon-Taylor and many others. Whipple described a two-stage operation in 1935. At the first stage, gastro-enterostomy and cholecystgastrostomy were performed, followed later by excision of the duodenum and head of pancreas, with closure of the pancreatic stump. Cattell united stomach to open end of duodenum by end-to-end anastomosis and transplanted the open ends of common duct and pancreas into the duodenum.
The fatality rate of excision of the head of the pancreas is falling, but it remains higher when performed for cancer of the pancreas than when performed for cancer of the ampulla. In 1942 Whipple recorded a mortality rate of 45 per cent, and in 1945 Cattell reported 17 operations performed within two years with only 2 operative deaths. A good many three year cures and some five-year cures of cancer of the pancreas treated by pancreatoduodenectomy have now been recorded.

While pancreatoduodenectomy remains the operation of choice for tumours of the ampulla and of the lower end of the common bile duct, there is an increasing tendency towards conservation in tumours of the head of the pancreas. Although there are exceptions, most patients who suffer from cancer of the head of the pancreas and who have had it treated by resection, are dead within a year, and a substantial portion die in six months. Aird has found that their longest survivals have been in patients treated conservatively. It would indeed seem reasonable that the relatively minor operation of cholecystoduodenostomy is to be preferred to the radical pancreatoduodenectomy, from which the patient may spend most of his remaining few months slowly convalescing. On the other hand, in the absence of any obvious metastases at laparotomy a total excision of the tumour might be quite possible.

**Prognosis.**

This largely depends, of course, on whether the pathology is chronic pancreatitis or a scirrhous carcinoma of the head of the pancreas. If it is the former he may suffer from recurrent attacks of abdominal pain from acute exacerbations of his pancreatitis and live for an indefinite number of years. On the other hand with the more likely diagnosis of carcinoma of the head of the pancreas he may look forward to six months to several years of relatively good health but eventually he will succumb to the relentless growth and spread of this malignant tumour. Meantime the patient should be encouraged to enjoy life and should certainly not be told of the likely gloomy prognosis, because after all it may not be true.
A CASE HISTORY

illustrating

THE ROLE of SPLENECTOMY in the Treatment

of

IDIOPATHIC (acquired) HAEMOLYTIC ANAEMIA.

Before admission to Northern Hospital Berwick there was a history of 41 weeks of "pumping noise in the ears", headache, irritability and vague ill-health, preceded by discolouration of the urine, and accompanied by pallor.

This in itself did not cause her much concern, as she was aware of recently irritability and easily tired. Some days later she developed pains in her ears which she described "feeling up a bicycle pump". Asking the question and answering was continuous, with frequency, and seemed to keep time with the pulse (72 per minute). Infatuated and needing her own things, but went to her father's house, just express purposes. The doctor, no doubt influenced by story, could find no positive conclusion that there were any pills, the nature of which is not known to the patient.

At that time her friends noticed, that the patient became rapidly pale, lethargic and very weak. Eventually the patient no longer go to work. She did not feel very unwell in her vision was impaired, there was no inapparent or dullness. The patient was then in her father's house. She did not have any sensation. The patient was not aware. The patient was admitted in a collapsed state. Immediate admission to the

Personal History.

There was no change in weight that appreciable has occurred.

There was no indication, and the patient has had slight alteration. She has not noticed any change in the condition...
Name:- Miss H.M. (24).
Occupation:- Unqualified nurse.
Date of Admission: 9/10/55. From Northern Hospital Dunfermline.

Complaints:-
Before admission to Northern Hospital Dunfermline there was a history of 2½ weeks of "pumping noise in the head", headache, irritability and vague ill-health, preceded by darkening of the urine and accompanied by pallor.

History:-
Until the end of August 1955 this girl appears to have been perfectly fit when she noticed that her urine was becoming "darker and stronger". This in itself did not cause her much concern, but she was aware of becoming irritable and easily tired. Some days later she developed noises in her ears which she described as like "blowing up a bicycle pump". On direct questioning she said that, like a bicycle pump, the noises were not continuous, but regular in frequency, and seemed to keep time with the pulse (she was a nurse). Thinking she needed her ears washed out she went to her doctor for that express purpose. The doctor, no doubt influenced by her biased story, could find no wax and concluded that there must be inflammation of the ear. Two days later she returned to her doctor to tell him "he would have to do something more about it". He prescribed some pills, the character of which is not known to the patient.

At that time her friends noticed that the patient was becoming rapidly pale, lethargic and very irritable. Eventually she could no longer go to work. She did not feel giddy, and her vision was unimpaired. There was no tingling or pins and needles in the fingers or toes. Her appetite was not too bad. She did not have marked palpitation, and did not exert herself sufficiently to become breathless. One evening after taking the pills she was violently sick and took to her bed in a collapsed state. Immediate admission to the Northern Hospital Dunfermline was arranged.

Although she was at once put on high doses of cortisone, jaundice developed in a few days and her condition did not improve. On account of the collapsed state of the veins they had to cut down in order to give a blood transfusion. The addition of ACTH to the cortisone therapy made little difference so that urgent splenectomy was seriously considered. The patient by this time, however, was no longer a good surgical risk, and the assistance of Sir James Learmonth was sought. She was rushed to the R.I.E. but it was then decided to try and build her up prior to operation, and for that purpose she was admitted to Ward 27 on 9/10/55.

Personal History:-
There has been no change in weight, her appetite has remained good. There has been no indigestion, and the bowels have remained slightly sluggish. She has not noticed any change in the colour of the /
the stools. Other than the darkening of the water, she has had no trouble with micturition. The periods have remained regular, persist for five days with an average blood loss which has not recently increased. She has always slept well and has no cough or spit.

**Previous Health:**

1. A vague blood disorder at birth with jaundice? erythroblastosis fetalis?.
2. Apart from a rare cold she will admit to none of the common childhood ailments – scarlet fever, rheumatic fever, measles, chickenpox, mumps or whooping cough.
3. She has never previously been off work and never before been in hospital as a patient.
4. Her only travel abroad was to Montreal (Canada) in 1954 where she stayed for one month.
5. No history of fever, septicaemia or malaria, and she is not subject to allergic phenomena such as hay fever, urticaria or asthma.
6. The question of taking numerous drugs was inquired into assiduously and exhaustively. This included:
   - Phenalhydrazine, naphthalene, benzene, nitrobenzine, promin, arsenic, lead, sulphonamides, quinine, pamequin, para-aminosalicylic acid, phenylsemicarbazide, phenothiazine, neorsphenamine, benzidrine, mesantoin, and antihistamines.
   - The various diseases for which these drugs are used were also inquired into, but with no positive result.
   - The only drugs she has taken are:
     - ASA.
     - Cod liver oil.
     - Codeine tablets (Tab. Codeine Co./B.P.)
     - Aspirin.
     - Unknown tablets taken for tinnitus (Ferrous sulphate) (Penicillin.)

**Family History:**

Living :- Father (48) Quite healthy.
   - She has no brothers or sisters.
Deceased:- Mother (44) From Rheumatic Carditis.

No history of anaemia or any blood disorder.

**Social History:**

Lives at home in Dunfermline with her father. She is clearly not inwardly content; she has changed her job as an unqualified nurse to a silk weaver in a factory. She went to Montreal with the intention of emigrating, but gave it up after a month and paid her own fare home. She is unmarried.
She used to smoke about five cigarettes per day, but has stopped since going on cortisone. More or less teetotal.

On Examination:

Except for her pale and slightly icteric appearance and her marked tiredness this girl appeared fairly healthy. The mucous membranes were poorly injected. There was no purpura or rash, there was no venous engorgement, sacral oedema or swelling of the ankles. She was afebrile and of good development, muscularity and nutrition. Her capacity as a witness, however, was not very commendable.

Cardiovascular System:

Radial Pulse = 95/min. regular in time and force, and of moderate volume. The character of the wave was normal and the vessel wall was impalpable.
Blood Pressure = 130/60.

Examination of hands: - Not excessively warm but rather moist. No finger clubbing or koilonychia.

Neck vessels: - No venous engorgement or abnormal pulsations.

Heart: -
Inspection: - No subclavicular pulsations were seen.
Palpation: - Apex beat in mid-clavicular line. No other pulsations were present, no thrills.
Percussion: - Areas of cardiac and hepatic dullness present and within normal limits.
Auscultation: - A soft blowing systolic murmur replaced the first heart sound in all areas. This murmur was best heard in the mitral area, and was propagated into the left axilla. The second was clear and closed in all areas, and was nowhere abnormally accentuated. The long pause was silent. There were no adventitious sounds.

Respiratory System:

Breathing: - 18/min. regular and costo-diaphragmatic.
No cough or spit.

Chest: - Well developed and symmetrical in form and movement.

Palpation: - Good and equal expansion (3")
Vocal fremitus unimpaired and equal throughout.
Trachea central.
No supraclavicular, submental or axillary glands were palpable. There was no thyroid enlargement.

Percussion: - Normally resonant and equal throughout.
Auscultation: - Vesicular breathing in all areas with no accompaniments.
Vocal resonance unimpaired and equal throughout.

Alimentary System:

The lips were pale but there was no angular stomatitis or any
evidence of glossitis. Some gingival infection was present and the teeth were carious, but the breath was not offensive.

**Abdomen:**

A little plump but not markedly obese, moved freely with respiration, showed no scars or veins or local prominences.

**Palpation:**

There was no resistance (superficial or deep) or tenderness. Only a few inguinal nodes were palpated, they were soft, nontender, mobile and present on both sides.

Neither the spleen nor the liver could be palpated. The kidneys likewise could not be felt. There were no abnormal masses.

**Percussion:**

Confirmed the absence of clinical splenomegaly or hepatomegaly.

**Auscultation:**

Normal bowel sounds heard.

**Faeces:** Well formed and slightly better pigmented than normal.

**Nervous System:**

She tended to be depressed, and when so, had rather limited power of concentration. Her memory was quite good, however, and she had no trouble with her speech.

There was no evidence of meningeal irritation (Chin-on-chest and Kernig's Tests).

Each of the cranial nerves were tested individually, and all found to be intact and fully functional. The pupils were circular, central and of moderate and equal size. They reacted to light both directly and consensually and to accommodation.

There was no retinopathy.

No involuntary movements could be detected and muscle tone in all limbs was normal. The co-ordination tests were well performed.

**Reflexes:**

- Biceps: +
- Triceps: +
- Supinator: +
- Knee J.: +
- Ankle J.: +
- Babinski: +
- Abd.: +

No clonus.

Both superficial and deep sensation (touch, pain, vibration and proprioception, respectively) were unimpaired. Stereognosis was faultless.

**Examination of Urine:**

Yellowish-brown in colour, with no obvious deposit.

- S.G. = 1.018 acid.
- Urobilinogen = ++
- Bile pigments = -ve
- Bile salts = -ve
- Albumen = -ve
- Bile sugar = -ve
- Acetone = -ve

Microscopically - No RBC, pus cells, casts or organisms present.
### Examination of the Blood:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
<td>21%</td>
</tr>
<tr>
<td>RBC</td>
<td>1.1M</td>
</tr>
<tr>
<td>CI</td>
<td>0.95</td>
</tr>
<tr>
<td>Reticulocytes</td>
<td>15.4%</td>
</tr>
<tr>
<td>WBC</td>
<td>24,270/cmm. Differential Count normal.</td>
</tr>
<tr>
<td>ESR</td>
<td>164 mm/hr at Dunfermline.</td>
</tr>
<tr>
<td>Coombs' test</td>
<td>strongly positive</td>
</tr>
<tr>
<td>Paul Bunnel</td>
<td>agglutination of sheep RBC up to and including a serum dilution of 1:16.</td>
</tr>
<tr>
<td>RBC fragility</td>
<td>normal</td>
</tr>
<tr>
<td>Serum bilirubin</td>
<td>2 mgms%</td>
</tr>
<tr>
<td>Direct van den Bergh</td>
<td>negative</td>
</tr>
<tr>
<td>Sternal Marrow</td>
<td>normoblastic hyperplasia</td>
</tr>
</tbody>
</table>
When this girl presented herself to her general practitioner she complained solely of noises in the head which she felt sure were due to inflammation or wax in the ear. Although he could not have found any good reason for it on auroscopic examination, the doctor prescribed penicillin tablets. By her second visit a few days later the demanding tone of her voice (you'll have to do something more about it) and her increasing pallor and lethargy must have underlined the symptoms of anaemia. Now, since the commonest cause of anaemia in a woman of child-bearing age is a post-haemorrhagic anaemia consequent to excessive menstrual loss, it is perhaps understandable why iron tablets were prescribed. However, there was no history of menorrhagia and the doctor failed to enquire specifically as to whether there had been any change in the colour of the urine or stools - his one guiding symptom in this case to the correct diagnosis. She herself had no doubt at all about the early darkening of her urine, and simply did not mention it to the doctor because she thought it irrelevant and "he didn't ask, so why should I tell him?"

Two very simple tests - the determination of the blood haemoglobin and urinary urobilinogen - could quite easily have been carried out by the practitioner in the first instance and this might have avoided to some extent the development of such a collapsed state before a diagnosis was made.

The haemoglobin on admission was 21%.

There is nothing in the history to suggest an acute blood loss, while the observation that the colour index is within normal limits contra-indicates the occurrence of a chronic blood loss. The anaemia might therefore be due to either hypoplasia of the bone marrow (primary or secondary) or it could be due to the excessive breakdown of erythrocytes within the body. The presence of jaundice with an excess of urobilinogen in the urine point to a haemolytic anaemia, while the reticulocyte count of 15.4% refutes any possibility of a bone marrow hypoplasia. Sternal puncture subsequently demonstrated a normoblastic hyperplasia.

A diagnosis of congenital haemolytic anaemia is opposed by the age of the patient (24), the absence of a family history of anaemia or jaundice, and by the absence of any clinical splenomegaly. No spherocytosis was seen in the blood film and the fragility of the red cells was normal. No history could be elicited of a preceding bacterial infection (e.g. haemolytic streptococci, staphylococci, clostridium welchii) nor of any protozoal infection (e.g. malaria). An exhaustive investigation into the consumption of any one of numerous drugs and poisons was made without avail. It would therefore seem that the haemolytic anaemia is not due to any infective or toxic factor. The rare condition of porphyrinuria with which a haemolytic anaemia may be associated was excluded by a determination of the faecal and urinary porphyrins. The haemolytic anaemia which may occur in infective mononucleosis was excluded by the low titre obtained in a Paul Bunnell test.

The
The patient had never previously been transfused. There was no history of skin rashes or joint pains to suggest syphilis, and on clinical examination there was no evidence of cirrhosis of the liver, nor any chest, alimentary or renal signs to suggest tuberculosis. The patient is too young for any malignant disease to be likely. The high white count \((WBC = 24,000/c.mm)\) would be indicative of leukaemia if it were not for the high reticulocyte count. The present haemolytic anaemia does not, therefore, appear to be symptomatic in origin. A paroxysmal haemoglobinuria is contraindicated by the occurrence of jaundice and the presence of excess urobilinogen in the urine. By the process of exclusion there remains the diagnosis of idiopathic (acquired) haemolytic anaemia. This received positive confirmation from the strongly positive Coombs' test for immune globulins.

**TREATMENT and PROGRESS.**

Initially the patient responded well to blood transfusion with packed cells and to full dosage of cortisone. The graph of reticulocytes against blood haemoglobin not only displays the patient's progress, but also illustrates very clearly the reciprocal relationship between the reticulocyte count and the level of the blood haemoglobin.

However, as the dosage of cortisone was gradually reduced she steadily deteriorated and it was only a matter of a few weeks before she was once again severely fatigued, irritable and jaundiced with a dark urine. Clearly her haemolytic anaemia could not be kept in check with a maintenance dose of cortisone such as might be compatible with long term therapy. Even this short course of high dosage had produced a moon-face and purpura had appeared on her arms and legs.

Splenectomy was therefore seriously considered. Indeed there was little else that one could do. She was therefore prepared for operation by further blood transfusion and a return to full dosage of cortisone. Although theoretically such high doses of cortisone might be expected to inhibit wound healing, this is not found in practice.

27/12/55 **Splenectomy** - General anaesthesia.

The patient was placed in the supine position with the left side raised up by a sandbag under the lower ribs posteriorly. A transverse upper abdominal incision was made and both recti muscles were divided with diathermy.

The spleen was enlarged to less than twice its normal size and was very soft. There was a spleniculus in the gastro-splenic ligament and numerous structures which were considered to be haemolymph glands...
were observed along the upper border of the pancreas. The tissues were soggy and there was considerable oozing. The liver appeared to be normal. Access to the spleen was difficult and it was torn during the process of removal. The bleeding points were secured seriatim and oozing controlled by a pack which was removed at the end of the operation. The bleeding points were ligated with cat-gut and a continuous haemostatic stitch was used to approximate the cut edges of the posterior peritoneum and the edge of the gastro-splenic ligament.

The peritoneum and posterior sheath of the rectus were closed with a continuous catgut stitch, and the anterior sheath with through and through stitches of silk and interrupted fine silk. The skin was closed with a continuous silk stitch and a cracker dressing was applied. In view of the fact that she was on high doses of cortisone the stitches were left in for three weeks.

Pathology of the Spleen:

The slightly enlarged spleen (230 grams) showed four moderately sized and fairly old infarcts. The spleniculus measured 1.5 cm in all its diameters. On naked eye section the splenic tissue showed slight prominence of the Malpighian corpuscles, due partly to their enlargement and partly to intense congestion of the red pulp. The lymph nodes showed no macroscopic abnormality.

Microscopically the splenic tissue showed the sinuses in the non-infarcted areas to be prominently filled with red blood cells. Endothelial cells and macrophages were also very numerous in the pulp. Haemosiderin was widely distributed both intra- and extracellularly. The splenic lymphoid follicles were prominent by virtue mainly of active germinal centres, but lymphocytes were not widely distributed in the pulp. The lymph nodes showed similar germinal activity.

These appearances are consistent with those of an acquired haemolytic syndrome.

Progress (continued).

The response to splenectomy was initially very promising. For several weeks she maintained her haemoglobin at a high level with a falling reticulocyte count while the dosage of delta-cortisone ("prednisone") was being steadily reduced from 25 mg/day to 10 mgm/day. However, about eight weeks after splenectomy and very shortly after the reduction in delta-cortisone had reached the level of 10 mg/day relapse occurred - her haemoglobin started to fall, the reticulocyte count to rise, and she once again began to feel tired. Occasionally she developed a slight icteric tinge in the sclerae, but in general she managed to maintain her haemoglobin between 57 - 70% over the next twelve months. Even in a dosage of delta-cortisone of 10 mgm/day she had a degree of moon-face and an embarrassing papular rash over the /
the face and neck. She was able to take a sitting job as a clerkess for months after splenectomy. Nine months after splenectomy all treatment was withdrawn and she remained much the same for about a further one year — that is to say, she continued haemolysing but at a rate at which her bone marrow could more or less keep up with. Subsequently, however, this balance became disturbed; she became more icteric, markedly anaemic and suffered from recurrent syncopal attacks. She was re-admitted to hospital and given four pints of packed cells. Within a fortnight her haemoglobin was back to 58% with a persistent reticulocyte count of 31%. A month later (10/4/58) without any further treatment her haemoglobin was 57%.

In summary, then, this young girl developed a haemolytic anaemia for no apparent reason some two and a half years ago. The onset was fairly rapid and her haemoglobin was reduced after a history of 2-3 weeks to 21%. It is possible of course that this haemolytic condition had been smouldering for some time before developing into a crisis. The initial response to full doses of cortisone was encouraging, but as soon as the dose was reduced haemolysis resumed. Splenectomy was performed and although the early results were encouraging this operation proved to be only partially successful.

Aetiology and Pathogenesis.

Acquired haemolytic anaemia is associated with the presence of a circulating antibody, active at 37°C, though in a small proportion of cases activity only occurs when the blood in some part of the circulation is cooled below the normal temperature. The antibodies concerned are auto-antibodies to which the patient's erythrocytes are susceptible. Red cells from patients with this disease can be shown by the antiglobulin test to be coated with antibody, whose existence in the plasma also can be shown by indirect antiglobulin tests or the use of enzyme treated cells. It has been demonstrated (Dacie and Mollison 1943, Brown et al 1944, Mollison 1947) that if patients with acquired haemolytic anaemia are transfused with normal red cells these cells are rapidly eliminated, and this is exactly what happened when she was given four pints of packed cells in February 1958. More recently, Selwyn and Hachett (1949) have shown that prior to their elimination the normal corpuscles may also be coated with antibody, and so react with antiglobulin serum. On the other hand, apart from an initial phase of increased destruction the red cells of the patient are eliminated from the circulation of a normal recipient at a normal rate.

In spite of the fact that antibodies capable of producing haemolysis in vitro are difficult to demonstrate, it seems reasonable on the above evidence that the presence of auto-antibody plays an important part in the pathogenesis of acquired haemolytic anaemia.

Thus /
Thus it could be that the blood cells of the patient might be slightly altered by contact with some extraneous substance, drug, viral or bacterial enzyme and so trigger off a process of auto-immunisation with the production of auto-agglutinins and haemolysins. Whether or not acquired haemolytic anaemia arises in this way is not proven. An alternative mode of production of the auto-antibodies may be as the result of a primary abnormality of the plasma-protein and antibody-forming mechanism. The problem is a very complex one, and although fascinating it would not be profitable to explore it further at this juncture. Unfortunately, in the present instance no attempt was made to demonstrate the auto-antibodies described above.

Some workers are of the belief that the haemolytic crises that are characteristic of AHA may be due to a sudden arrest of the hyperplastic erythropoietic process superimposed upon excessive haemolysis.

Rationale of Treatment.

1. Transfusion:-
   Repeated transfusions of packed cells were required to sustain this girl's life. Packed cells were given slowly in order to avoid precipitating failure in a heart with an already augmented output on account of anaemia. The pulse rate prior to transfusion was rapid (95/min.), the apex beat was in the mid clavicular line, and there was a soft blowing systolic murmur. Much care had to be taken in the blood typing since reactions are particularly liable to occur in acquired haemolytic anaemia. The problem of finding appropriate blood became quite a difficult one after she had had repeated blood transfusions. When it was necessary to have her teeth extracted she had to be re-admitted to hospital for in the event of excessive bleeding it might not otherwise have been possible to find a suitable donor.

2. Cortisone:-
   In most patients with acquired haemolytic anaemia remissions can be induced by the administration of ACTH or cortisone. The importance of adequate dosage is to be stressed. Remissions can often be maintained for long periods by the continued administration of these cortical steroids (M.R.C. Report : 1955).
   When ACTH or cortisone is given to patients with acquired haemolytic anaemia it has been reported that the changes that occur in the antibody titre do not vary directly with change in haemolytic activity. Indeed, Meyers et al (1952) report a case in which a marked rise in the titre of auto-immune bodies occurred at a time when clinical and haematological remission was evident. This would suggest that the administration of these steroids may restore haemopoietic equilibrium through a combination of effects, including modification of antigen-antibody reactions, diminished red cell destruction.
destruction by the reticulo-endothelial system, and myeloid stimulation. In the present case there was remission with full dosage of cortisone, but when the cortisone was reduced a relapse occurred.

In summary it is quite clear that the use of cortisone or delta cortisone in acquired haemolytic anaemia is at the moment quite empirical. Delta cortisone is preferred to cortisone since it is about five times more active (so that 75 mg/day is a full dosage) and is thought to be less liable to produce fluid retention.

3. Splenectomy

Among the physiological activities of the spleen are included reservoir function and sequestration of erythrocytes, haemopoietic activity at certain phases of life, phagocytic and reticulo-endothelial activity, possibly hormone production, and capacity to elaborate antibodies. A number of these functions may be of importance in the basic pathology of acquired haemolytic anaemia, either through a primary functional derangement or through the operation of a normal physiological mechanism on unduly susceptible cells.

The association of circulating auto-antibodies with acquired haemolytic anaemia at once suggests that the spleen may be the major site for the production of these auto-antibodies. Splenectomy in this condition is sometimes followed by a sharp reduction in the level of auto-antibody, but in other patients the reduction may be slight, or may not occur at all (Dacie 1954). Thus it is probably fair to conclude that although the spleen may be a site of auto-antibody production, it is not the only site. Since splenectomy is in fact successful in improving the condition substantially, or even in producing a clinical cure, in about 50% of cases it seems likely that some other splenic function is also involved.

Cell sequestration and concentration in the splenic sinuses perhaps augmented in acquired haemolytic anaemia by erythrocyte agglutination due to the action of the circulating auto-antibodies is probably of great importance. Sequestration may lead to local spherocytosis with an increased fragility, and therefore susceptibility to haemolysis. Congestion and haemosiderosis were prominent features of the splenic histology in this case, which indicates that erythrostatic and phagocytic activity within that organ must have been considerable. Some confirmatory evidence for this hypothesis is to be found in the vascular anatomy of the mammalian spleen. Kinisely (1936) demonstrated that blood from the Malpighian bodies passes through arterioles and arteriolar capillaries into venous sinuses from which further circulation into the collecting venules is controlled by an efferent sinus sphincter. Closure of this sphincter leads to gross distension of the venus sinuses and the wall of the dilated sinus comes to act as a filter which allows plasma to escape into the splenic pulp but retains the erythrocytes and platelets. Although Kinisely's conception is now widely accepted and suits our present purpose, it must be remembered that it is but one of several views
views on the complex subject of the splenic circulation which has been extensively reviewed by Bjorkman (1947).

The mere aggregation of red cells in packed masses may be followed by anoxic degenerative changes, with the production of metabolites possessing osmotic activity which tend to give rise to haemolysis. Selweyn and Dacie (1954) postulate a degenerative change in the cell membrane as the factor of prime importance in lysis and no doubt several mechanisms are potentially available in the spleen whereby the red cell membranes may be weakened. Nevertheless, the spleen does not appear to be by any means the only organ of red cell destruction for under normal conditions the life-span of erythrocytes after splenectomy is not significantly increased.

In conclusion, a substantial number of cases of acquired haemolytic anaemia seem to be immuno-allergic in origin. The success of cortisone and delta-cortisone is most probably due to their effect in modifying antigen-antibody reactions. The success of splenectomy in some cases probably lies mainly in the removal of a site of increased erythrocyte or platelet destruction, the result not necessarily of a primary disorder of splenic function, but rather of the operation of a possibly normal splenic function on sensitised blood elements. On the other hand, the failure of splenectomy in some cases is due to remaining spleniculi undergoing hyperplasia. In the present instance, however, spleniculi were carefully looked for and the only one found was totally removed.

Prognosis.

This girl has not been one of the fortunate few who achieve a complete clinical cure after splenectomy. A follow-up over two and a half years has indicated that delta-cortisone in moderate dosage has very little effect and that probably the best way to manage this case is to encourage her to continue at work and recreation which are within her physical abilities, to see her at monthly intervals or more frequently as symptoms demand so as to keep a check on her blood. Apart from admitting her to hospital to tide her over periods of relapse with blood transfusions there is no effective treatment. The finding of suitable blood to transfuse is likely to become increasingly difficult. There is as yet no evidence of biliary disease but in the presence of continued excessive haemoglobin she is certainly a candidate for the formation of multiple pigment calculi and these may make themselves clinically manifest at a later date.

Her prognosis is therefore almost entirely dependent on the natural history of disease and this is largely unpredictable.
REFERENCES.


Summary.

This series of cases has been given its rather lengthy title for two reasons.

Firstly, not all of the patients included actually suffered from jaundice although they all had conditions which commonly give rise to jaundice. Case 3 never had any jaundice yet 16 years prior to admission "twenty three little yellow stones" were removed from her biliary passages. A further sixteen stones were removed from her bile ducts at a second operation. Just how many stones can you have in a common bile duct without causing sufficient obstruction to precipitate jaundice ? That is difficult to answer, but with stone proven to be present in the common bile duct jaundice is said to be absent in 13 per cent of cases according to Jordan and Weir, in 26 per cent according to Judd and in 35 per cent according to Trueman (quoted from Aird "Companion in Surgical Studies" 1957).

The second reason for choosing the present title, rather than the briefer one of "Surgery of the Biliary Tract", is simply because case 6 has no demonstrated lesion in her biliary system. Nevertheless, as pointed out in the discussion of that case, she may well be accumulating a veritable mass of biliary mud and pigment calculi. This interesting case was included in the series as she illustrates that surgery in jaundice is not restricted to the post-hepatic obstructive variety. It also gave me the opportunity of following her progress over the two and a half years since I first met her.

Whether or not the surgeon should remove asymptomatic biliary calculi which are incidentally discovered is a vexed question and one over which physicians and surgeons frequently disagree. Gallstones occur in 5 - 10 per cent of the population and while it is not possible to say what proportion of these stones give rise to serious illness it is quite obvious that the majority do not and the patient remains unaware of their presence. Yet the previously asymptomatic stone can at any time render the patient acutely ill. Case 1 suddenly developed obstructive jaundice in February 1957. This was treated medically and was followed six months later by gall-stone ileus. Before her biliary troubles were over she came very close to death's door.

Case 2 had a cholecystectomy over 20 years ago and a return of symptoms of obstructive jaundice during the past 12 months. Largely at the patient's request and also because of her hypersensitivity to iodine her biliary tract was not fully re-investigated and she too was treated medically; but the next time a stone impacted in the ampulla of Vater it was contemporary with a myocardial infarct and the combination proved fatal. It is interesting to note that artificial distension of the common bile duct or of the gall-bladder at operation may cause electro-cardiographic disturbance. Stokes-Adams seizure and attacks of angina pectoris have been alleviated substantially by suitable treatment of cholelithiasis. Perhaps, therefore, /
therefore, the history of angina of effort in case 2 should have been regarded as an additional indication for early surgical treatment.

Quite apart from the history of angina of effort, case 2 was subsequently shown at necropsy to have developed a degree of biliary cirrhosis as a result of recurrent attacks of obstructive jaundice. A further attack of biliary obstruction and impaired circulation consequent to myocardial infarction resulted in the development of hepatic failure.

A more potent argument in favour of early operation on biliary calculi is that the operative mortality from simple cholecystectomy is 1.5 per cent., but in the presence of obstructive jaundice it is 14 per cent.

Cases 2 and 4 illustrate that biliary calculi may once again become clinically manifest many years (23 and 16 years respectively) after previous cholecystectomy. The mechanism of their production is obscure.

Case 3 illustrates how physiology can be applied to explain the circulatory disturbance associated with the Waltman – Walter's syndrome. If the patient had lived long enough the extravasation of bile may have subsequently produced an obliterative cholangitis.

Case 4 is an example of the frequent association of chronic pancreatitis with biliary calculi. Case 5 demonstrates how it may be extremely difficult to distinguish clinically between a scirrhous carcinoma of the head of the pancreas, "silent" stone and chronic pancreatitis. Indeed, without taking a biopsy it remained impossible at operation to decide whether this patient had in fact a carcinoma of the head of the pancreas or a simple chronic pancreatitis. The technical difficulty of being sure whether or not a bougie introduced into the common bile duct and passed towards the duodenum actually enters the duodenum without opening that structure to see is also exemplified in case 5.

In conclusion this short series of cases illustrates a few of the many interesting facets in the surgical management of conditions commonly associated with jaundice.