

THESIS.

** CLINICAL NOTES on a CASE of HEPATIC ANEURYSM **
with analysis of symptoms, with diagnosis,
pathology, etc., of this disease.

By

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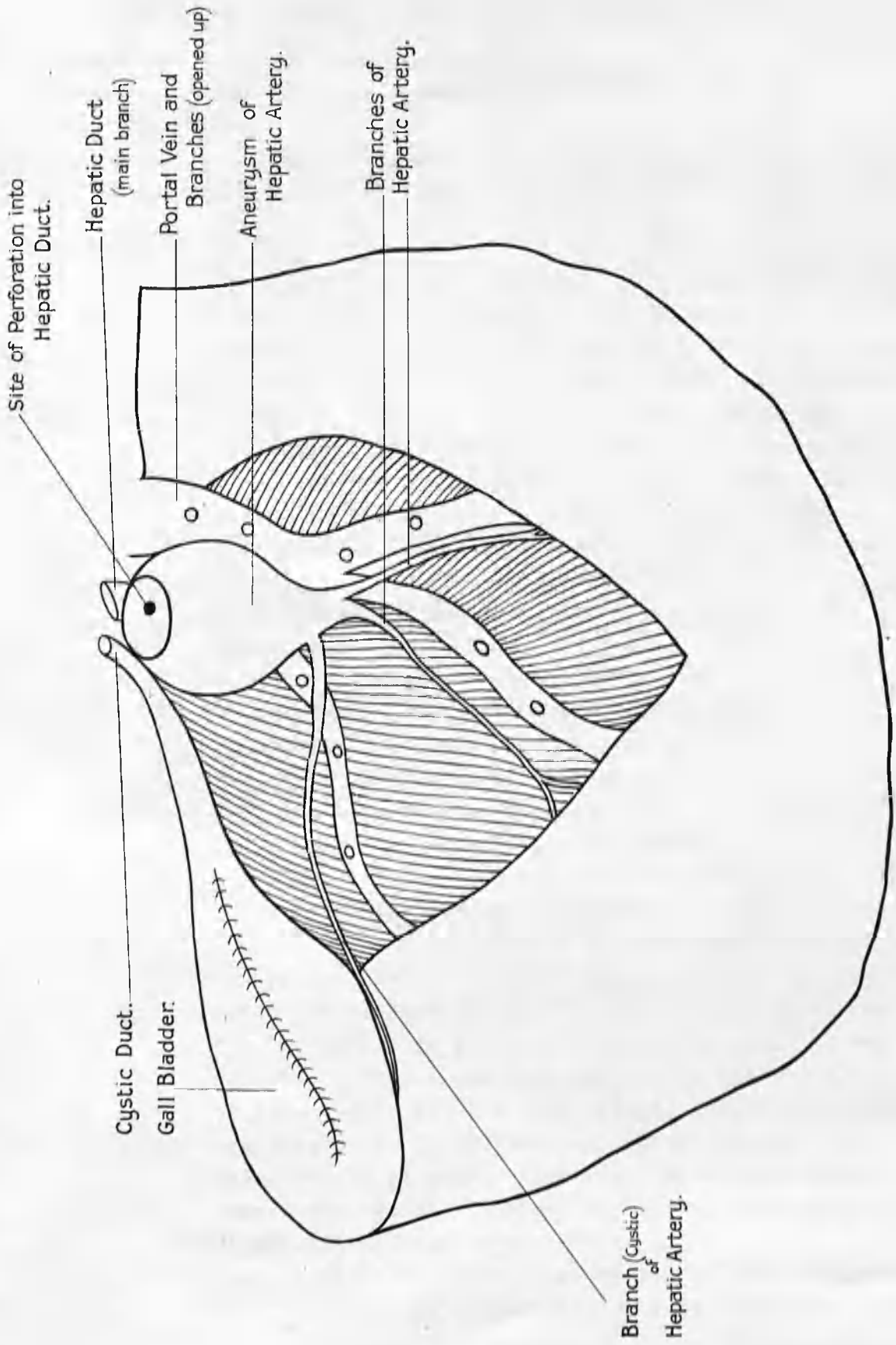


Diagram by DR. LEONARD FINDLAY.

**** CLINICAL NOTES on a CASE of HEPATIC ANEURYSM ****

with analysis of symptoms, with diagnosis, pathology, etc., of this disease.

Fred Williamson, policeman, aged 53 years, weight about 15 stones, height about 5 feet 10 inches.

HISTORY - Previous Illnesses.

(a) Until March 5th. 1906, the patient enjoyed excellent health. On that date he was riding on horseback, when the horse swerved, and he was nearly thrown out of his saddle. By seizing the horse's mane, and with great effort, he was able to regain his equilibrium. On the following day, March 6th., blood appeared in the urine, scanty at first, but gradually increasing in quantity. Haematuria continued. During the first week the quantity was large. On and after the second week the quantity diminished, and about the fourth week haematuria disappeared.

I located the lesion to the left kidney. There was no renal colic, but slight aching and tenderness were felt over the region of the kidney. The treatment consisted of rest in bed, haemostatics, etc. What was the cause of the bleeding? It might be

- (1). The result of the accident,
- (2). The age of the patient, and his previous good health would favour the supposition of malignant disease.
- (3). Calculus.

After the patient had sufficiently recovered to leave his bed and to go about, I had him X-rayed with negative results. Thus I inferred that there was no calculus. As the patient did not lose weight, and improved with the treatment, I, for the time being, concluded that there was no malignant disease. My diagnosis was: Simple rupture of the blood vessels in the pelvis of the kidney, due to the accident. When the patient began to go about, he felt extremely weak, and was not able to resume duty until the

(2).

beginning of July. He never regained his former strength. I had him under observation, and shortly after the resumption of duty he began to complain of aching pain and weakness in the lumbar region. He would always refer the ache to the lower border of the liver posteriorly, i.e., at the eleventh and twelfth ribs, although the pain extended across the back. This was relieved when he was lying on his back. When not on duty, he was constantly resting, as he found comfort only in a recumbent position. I repeatedly examined his back, and palpated over the left kidney. He always maintained that the former pain and tenderness were now absent. I could not discover at any time tenderness where he now complained of pain.

(b). The patient, although he was complaining, was able to keep at his work until November 1907, when he was laid up with influenza. He was unable to resume duty until January 1908, as he was suffering from debility, as a sequela of influenza. He now remained at his employment until June 22nd., when he was off for two days with a slight attack of influenza. I desired him to stay in bed, but he was anxious to get back to work. When I met him outside, he looked anxious and languid. On July 19th., I received a sudden call to visit him at his house, as he was suffering from a severe pain in the abdomen. On arrival, and on examination, I found that he was affected with hepatic colic, which was very severe. I gave him a hypodermic of morphia, which relieved him. He looked very ill, and was prostrated. On the following morning he felt so well that he went out to do partial duty. I met him outside; he looked sallow, and slightly anaemic. He had a second attack of the pain on the 31st. - i.e. 12 days after the first attack. This time it was more severe than on the first occasion. I gave him

another hypodermic. He maintained that the pain was beyond endurance, and that something would have to be done to prevent its recurrence. On August 1st. I had a consultation with a physician. He agreed with me that it was a case of cholelithiasis. He gave the patient permission to get out for a short time each day. The patient, when out that evening, as he sat in the office, had another severe seizure. We had him removed home. We instructed the patient's wife to examine the faeces for gall-stones. On doing so in the morning when the bowels acted, she found that the motions were not natural, but that they were tarry. When I examined them, I found that they consisted of about a small bowlful of dark blood, having the shape of the lumen of the bowel. This indicated that the blood was coming from the upper bowel. I now regarded the case from a new point of view. I still regarded it as a case of gall-stones, complicated with haemorrhage, the latter being due either to duodenal ulcer, or to rupture of bloodvessels in the bile passages from the transit of the calculus. The physician was by this time absent on holiday, but before he went he suggested that if there were any fresh developments, a surgeon should be called in. On the evening of the 2nd August, I called in the surgeon. In giving him the history of the case, I informed him that it was, in my opinion, one of gall-stones, complicated with haemorrhage, the source of which was either in the duodenum or in the bile passages. We agreed that medical treatment was now of no avail, and that it was necessary to make an exploratory incision to get at the cause of the bleeding. The patient was removed to a Nursing Home that evening, and on the following day, Monday, 3rd. of August, he was operated on. On opening the abdomen, the surgeon searched for the common duct; he found no calculus either in it, or in the hepatic, or in the cystic duct. He then fixed the

base of the gall-bladder to the edges of the wound, and opened it. He found that it contained a small handful of dark clotted blood, in addition to a small quantity of bile. The surgeon did not proceed further with his exploration; he put a glass drainage-tube in the gall-bladder, and dressed the wound. The patient, on recovering from the anaesthetic, commenced to retch, with the result that bleeding occurred, and the nurse found the dressing soaked with arterial blood. She at once sent for the surgeon, who, on his arrival, had the dressing immediately removed. He discovered blood welling up through the tube; he was able with difficulty to arrest the bleeding with packing and pressure. There was a recurrence of bleeding within twenty-four hours. I called to see the patient on Tuesday, 4th August, the day after operation, and was informed by the nurse of what had happened. On thinking over the case, and knowing from inspection that the mucous membrane of the gall-bladder was normal and healthy, I came to the conclusion that the bleeding was not from the gall-bladder but from an aneurysm which had ruptured into the gall-bladder. On communicating with the surgeon, I was informed by him that he too had come to that conclusion. On Wednesday, 5th August, septic peritonitis set in, and the patient died on Saturday, 8th August. There was a post-mortem examination (a synopsis of the result of which is hereto appended), from which it was discovered that it was a case of aneurysm of the hepatic artery, which had burst into the left hepatic duct. This discovery verified the conclusion at which we had previously arrived. The blood-vessels were markedly atheromatous. The left kidney was found to contain a cicatrix, which demonstrated that the diagnosis of the cause of the haematuria was correct.

AUTOPSY.

Fred Williamson, Policeman, Maryhill.

Post-mortem examination, 10th August, 1908.

(Permission granted for examination of abdomen only).

AUTOPSY.Continued.

There was an operation wound in the region of the gall bladder, which had been stitched to the abdominal wall. The packing of the wound was markedly blood stained. On opening ^{the} abdomen, there was much exudation of yellowish purulent lymph in ^{the} operation region. After removal of the liver, an aneurysm, having the size of a pigeon's egg, was discovered high up in the gastro-hepatic omentum, and infringing on the hepatic tissue. The aneurysm was filled with laminated blood-clot, and had ulcerated through into the left hepatic duct, in which, and in both the cystic duct and gall-bladder, was much blood-clot. (The relationship of the aneurysm to the different structures is shown in the diagram). The liver was exceedingly fatty, and in the pelvis of the left ^{kidney} a cicatricial looking mark was visible. The abdominal aorta and main branches showed atheroma.

(Signed) Leonard Findlay.

History of hepatic aneurysm:-

Rolland in 1908 collected records of thirty-nine cases, which, with his own, made a total of forty. Since then, one other case has been reported. If we include our own case, the total at present, so far as we can discover, is forty-two.

Definition of hepatic aneurysm:-

Hepatic aneurysm is a circumscribed dilatation of the hepatic artery, distal to the origin of the pyloric and gastro-duodenal branches.

Symptoms.PAIN.

This symptom may be so slight that the patient does not complain of it unless the physician enquires about it; on the other hand, it may be so severe that the sufferer is almost maniacal while it lasts.

PAIN.

Continued.

Between these two extremes we may get various degrees of the symptom. What is the cause of this pain? In analysing this symptom in the cases recorded, we find it stated that it is either due to pressure of the lesion on a nerve, very probably the hepatic plexus, or to the injury of the liver substance and peritoneum when the lesion ruptures and the blood burrows a cavity for itself at the expense of these structures. From consideration of our own case, we would suggest that the pain may be due to spasm of the gall-bladder and bile-ducts, the contraction being excited by the presence of blood-clots in these structures (gall-bladder and ducts), i.e., of course only when the aneurysm ruptures into these organs.

From the above we find that we have to discuss three kinds of pain:-

(a). pain due to pressure or dragging of the aneurysm on the hepatic plexus or some other nerve.

In our case this pain was in existence more or less for over two years. It was of a gnawing, aching, neuralgic character, and was referred to the lower border of the liver posteriorly. There was no tenderness on palpation in this situation. The pain was relieved when the patient was recumbent. He never complained of it as occurring in the hypochondrium nor in the epigastrium. At first it was very slight, but as time went on, it became more commanding, and compelled the patient to rest on every available opportunity. Although the patient had influenza in November 1907, he was kept in bed for over a month, more on account of this pain. The interpretation which I put on this pain at that time and subsequently was that it was produced by adhesions dragging on the nerves in the cicatrix which resulted from the wound in the left kidney. Although the pain was referred to the right lumbar region, it extended to a less degree across to the left side. We get valuable information as to the

PAIN

Continued.

duration of the aneurysm from this pain. Until the accident on horseback, the patient was in excellent health, and as this pain started shortly after he went about, we can reason that the lesion originated as a result of the accident, and that it was in existence for more than two years.

I had in my experience another case of abdominal aneurysm. The only symptom of which the sufferer complained was a gnawing, aching pain in the lumbar region. The cause of this pain was understood only by a post-mortem examination, the patient dying suddenly from rupture of the aneurysm.

(b). pain which is, as a rule, continuous, and is of a stretching, tearing character, and terminates in death. It is not of long duration, and is due, as already mentioned, to rupture of the aneurysm when the patient shortly afterwards bleeds to death. This is the usual pain when the aneurysm is intra-hepatic, and when it ruptures.

(c). paroxysmal pain which is indistinguishable from gall-stone colic, the cause of the pain being the same, viz:- spasm of the gall-bladder and ducts. The exciting cause of the spasm is, however, different; in the gall-stones colic the spasm is excited by the presence of gall-stones; but in aneurysm rupturing into the gall-bladder the spasm is caused by blood-clot. (It is possible that in some instances slight spasm of the gall-bladder may arise from pressure of the sac on the duct, and perhaps on the gall-bladder. According to authorities, it is this cause which gives rise to the severe paroxysmal pain. When there is complete obstruction of the common duct, the bile will accumulate in the gall-bladder and ducts, and jaundice in due course will ensue. The gall-bladder, therefore, will contract to some extent in an attempt to overcome the obstruction. This, however, does not explain the severe paroxysmal pain (c)).

PAIN

Continued.

In our case the paroxysmal pain which started 19th of July, a fortnight before the operation, was a typical hepatic colic. Commencing in the right hypochondrium, it darted across through the epigastrium to the left hypochondrium. It started with surprising suddenness; the patient writhed in agony, and became sick and collapsed. The pain lasted about ten minutes. After its disappearance, there was a soreness in the right hypochondrium and in the epigastrium. The cause of this pain was spasm of the gall-bladder and of the bile-ducts. This was explained by the presence of the blood-clot in the viscus. We have an example of a similar kind of pain too, in post-partum pains, which cease only when all the clots are expelled from the uterus; also in injury to the kidneys we have severe renal colic, which is followed by the passage of elongated blood-clots having the shape of the ureter.

JAUNDICE.

Once or twice I discovered slight jaundice on the day following that on which the spasmodic pain occurred. The patient by this time was also anaemic, so that the discoloration was more marked. The urine at all times was apparently free from bile. I would explain the occurrence of the slight jaundice from the absorption of a small quantity of bile, the outflow of which was slightly interfered with either by the blood-clots in the gall-bladder or by pressure of the aneurysm on the hepatic ducts. Jaundice is stated to have been recorded in forty per cent of the cases.

FEVER.

In sixteen per cent of the cases recorded, the paroxysmal attacks were accompanied by high temperature (average, 104° F.) with rigors.

Some writers maintain that the cause of the above is the same as that which produced rigors and high temperature in gall-stone colic.

In our case there were no high temperatures nor rigors.

HAEMORRHAGE.

Another important symptom of hepatic aneurysm is haemorrhage. The bleeding may take place into the gall-bladder and ducts, into stomach and duodenum, into liver substance, and peritoneal cavity, and into the portal vein. When it occurs into the bile passages, it will find its way by the cystic duct into the gall-bladder, and by the common duct into the duodenum, giving rise to melaena; and, if the quantity is large, to haematemesis. When the gall-bladder is filled up, this bleeding will in all probability be checked, hence this haemorrhage is described as recurrent. The blood will coagulate in the gall-bladder, and the coagula will excite hepatic colic. This symptom, hepatic colic, will also be recurrent. Consequently, when we get a case of melaena, with or without slight haematemesis, followed by severe hepatic colic, the most likely cause is aneurysm of the hepatic artery rupturing into the gall-bladder or bile passages.

In a case of gall-stone with bleeding from duodenum due to injury of bile passage by the transit of the stone, the colic will be the first symptom, and the malaena follows. This is the reverse of the above.

When the sac ruptures directly into the (a) stomach or duodenum, we have a variety of gastric or duodenal ulceration. If the opening is at first but small, a coagulum may form, checking the bleeding for the time being; but it is more likely that the haemorrhage will be continuous, and death will speedily ensue. When the aneurysm is intra-hepatic, and the rupture takes place into (b) the liver substance, the bleeding is likely to be continuous, and not intermittent. If the aneurysm ruptures into (c) the peritoneal cavity, the bleeding will be continuous, and will quickly end in death. Haemorrhage then into (a) stomach or duodenum, (b) hepatic substance, and (c) peritoneal cavity, seems always to be continuous, and not intermittent. By contrast we may infer that recurrent haemorrhage with hepatic colic is peculiar to cases of hepatic aneurysm

HAEMORRHAGE.
Continued.

rupturing into the bile passages; and it is only in these cases that the prognosis will be favourable.

In our case we only discovered haemorrhage on Sunday morning, 3rd August, when we gave orders to have the faeces examined for gall-stones. The faeces should always be examined in all cases of hepatic colic. From the first appearance of the spasmodic pain and the anaemia, we would infer that the first bleeding took place about a fortnight before. The spasm occurred only when the patient was resting, never when he was walking or standing. We would reason that the bleeding occurred when the patient was in the erect posture and walking. When he was in a recumbent position, the bleeding would probably be checked, and a blood-clot would form which would plug up the opening. The blood in the viscus would coagulate, and consequently would act as a foreign body, and excite the spasm. There was no apparent interference with the portal circulation, unless that the patient was subject to slight dyspeptic symptoms. There ^{were} ~~was~~ neither haemorrhoids nor ascites, and there ^{was} ~~were~~ no haematemesis. On examination, the liver dulness was never increased. Once or twice I found the gall-bladder dulness slightly increased; the spleen was apparently normal, and there was nothing abnormal to be detected in the kidneys. As there was a probability of the haematuria recurring, I tested the urine now and again for several months previous, and always found it normal and free from blood and albumen. The heart and lungs, the nervous system, etc., were sound.

ANAEMIA.

This symptom is present in cases where the aneurysm ruptures into the gall-bladder or bile-ducts. It is due to repeated haemorrhages; it may be noticeable after the first large haemorrhage, or after several small ones. In our case I first observed anaemia two days after the initial hepatic colic, i.e., twelve days before the operation. I met the patient when he was on his

ANAEMIA.Continued.

beat; he looked shrunken and sallow, like a person who was suffering from ^{either} pernicious anaemia, ^{or} bleeding haemorrhoids, or an internal malignant growth. Although I diagnosed the case as one of cholelithiasis, this sign of anaemia made me very uneasy as regards the condition of the patient. As already mentioned, there was now no haematuria to account for it, and it was only on discovering the melaena that we had a clue as to its cause. The presence of recent anaemia following on hepatic colic would be a useful sign in diagnosing a case of this particular type of aneurysm of the hepatic artery.

DIAGNOSIS.

All the writers on this subject maintain that the disease can only be diagnosed during life by means of laparotomy. From the experience of this case, I think that, if a similar case were given, we would come as near as possible to a correct diagnosis, and before operating we would be prepared to treat the case. We had the typical hepatic colic and the sudden appearance of the anaemia, then the discovery of the melaena, and the slight jaundice. In giving over this case to the care of the surgeon, I suggested that it was one of two things, cholelithiasis complicated either by bleeding from a duodenal ulcer, or by bleeding from the bile-passages, caused by the injury of the stone. In reasoning the matter out, we may, in all probability, exclude duodenal ulcer, because the patient had neither hunger pain, nor any other symptom of that disease. For the bleeding to be so profuse from the bile-passages, the injury which caused it would have to be severe. In long-standing cases of gall-stones complicated with cholecystitis, there is sometimes slight haemorrhage. Naunyn in his treatise on cholelithiasis refers to several cases complicated by bleeding from a duodenal ulcer, and by bleeding from the bile-passages from ulceration produced by the stone in its passage to the bowel. He mentions, somewhat vaguely, aneurysm of the hepatic artery

DIAGNOSIS.
Continued.

being ruptured by the transit of the calculus. The writer on gall-stones in Albutt & Rolleston's "Practice of Medicine" says, "The diagnosis of cholelithiasis chiefly rests on the paroxysmal attacks of pain starting in the right hypochondrium, and radiating thence over the abdomen, and through to the right scapula. The attacks are accompanied by vomiting and collapse, and sometimes followed by jaundice. The gall-stones are to be diagnosed from the following:-

- (1). Hysteria (nervous spasm).
- (2). Acute dyspepsia with flatulency.
- (3). Appendicular colic.
- (4). Right renal colic.
- (5). Spinal neuralgia.
- (6). Malignant growths in or near the liver.
- (7). Pyloric stenosis.
- (8). Lead colic.
- (9). Chronic pancreatitis.
- (10). Duodenal ulcer.
- (11). Angina pectoris.
- (12). Tabetic crisis."

From Osler & Macraes' "System of Medicine" we find that the diagnosis of cholelithiasis comprises the recognition of the gall-stone colic, and of the many and associated lesions and sequels. "Severe pain in the epigastrium or in the right hypochondrium radiating around the chest or to the right scapula, accompanied by nausea and vomiting, and enlargement and tenderness of the gall-bladder, and followed by jaundice, and the discovery of a gall-stone in the faeces, are characteristic of the passage of a gall-stone, but jaundice is by no means always present, and the other symptoms may be provoked by cholecystitis in the absence of a gall-stone. Indeed, with increasing experience, it becomes often more and more difficult to say whether or not gall-stones are present in certain individual cases of obvious chronic biliary infections."

The above quotations lead us to ask the

DIAGNOSIS.
Continued.

question:- "Are gall-stone colic, hepatic colic, and biliary colic, produced by the same cause, viz:- gall-stones?" The writer in Albutt & Rolleston's book seems to suggest that gall-stones alone are the exciting cause of the spasm. The writer in Osler and Macrae's book is more careful; he gives the impression that the spasm can be provoked by several causes, e.g., cholecystitis, adhesions around the gall-bladder, etc. We would maintain that any solid or semi-solid body in the interior of the gall-bladder or in the bile-passages may give rise to the spasm. In our case we found that blood-clots gave rise to typical hepatic colic. We would also suggest that gall-stone colic is a species of hepatic colic; that the terms hepatic colic, gall-stone colic, and biliary colic are not synonymous, but that gall-bladder colic with spasm of duct, biliary colic, and hepatic colic, are synonymous. Or, to be more definite, colic occurring in connection with gall-bladder or with bile-ducts, large or small, may be due to other causes than calculus, and hence it is desirable to restrict the use of the term gall-stone colic, and not to use it as synonymous with hepatic colic. Blood-clots in the passages, as, for instance, in the case viewed above, may give rise to a colic clinically indistinguishable from gall-stone colic.

The writers on aneurysm of the hepatic artery say that the tumour is not palpable through the abdominal wall. Cases in this group where the aneurysm ruptures into the bile-passages, and where the bleeding is recurrent, are to be diagnosed from cholelithiasis with bleeding either from duodenal ulcer or from bile-passages. In duodenal ulcer we have the previous history of the symptoms peculiar to that disease. In simple bleeding from the bile-passages due to local injury the quantity of blood is not so large, and the bleeding is not usually recurrent.

In the group where the aneurysm bursts into the peritoneal cavity, or into the substance of the

DIAGNOSIS.

Continued.

liver, the bleeding, as a rule, is continuous, and the patient succumbs shortly after. There is a severe stretching pain with collapse. This could be confused with a case in which death was due to shock from passage of a gall-stone. It is only by post-mortem examinations that we can differentiate. Naunyn has had several cases of death from shock due to passage of gall-stone.

In the group where the aneurysm ruptures into the stomach or duodenum, we might wrongly diagnose the bleeding as being from a duodenal or gastric ulcer. Only one case has been recorded of aneurysm bursting into the portal vein; here again it is only by autopsy that we can discover the real cause.

ETIOLOGY.

Of the cases recorded where the sex is mentioned, seventy-five per cent were males, and twenty-five, females. Some authorities infer from this that, in regard to females, as the proportion is larger than in aneurysm of the abdominal aorta, and as gall-stones are more prevalent in females after the age of forty-one, hepatic aneurysm is probably caused by gall-stones.

Grunert says that eighty per cent of the cases collected by him were secondary to some infectious disease, viz:- osteomyelitis, pneumonia, and enteric fever, and he finds that sixty per cent of these cases were under thirty years of age and twenty-five per cent under twenty years of age. In only one case was the hepatic artery described as sclerotic.

Rolland and several others have described minutely the changes that have taken place in the wall of the bloodvessel (endarteritis), and attribute it to syphilitic virus. Several cases were recorded as due to trauma. The cases come from all classes of men.

From the above we can classify the cases as follows:-

- (1). Those secondary to other diseases, osteomyelitis, pneumonia, etc. These are probably due to emboli.
- (2). Those produced by gall-stones.
- (3). Those due to syphilis and tuberculosis,

ETIOLOGY.

Continued.

which act on the wall of the artery directly.
(4).Those due to trauma.

Our own case belongs to the last group. We have the age incidence when the arteries are atheromatous, the walls being no longer elastic, but rigid and brittle, and the exciting cause, - the accident on horseback described in the clinical notes.

We can infer the great strain put on the vessels when the patient was trying to regain his equilibrium. We have the abdominal tissues, including the bloodvessels, severely strained, and the lungs inflated, causing increased arterial tension. The increased blood pressure would overcome the resistance of the wall of artery. In the case of the kidney, the walls of the bloodvessels were completely ruptured; but we can infer that the rupture of the hepatic artery was only partial, and was the commencement of the aneurysm.

OPERATION

and

LIVING

PATHOLOGY.

The indications for operation are:- melaena more or less profuse, anaemia of recent origin, and severe hepatic colic.

Four cases, so far as can be discovered from the literature dealing with aneurysm, have been operated on, one successfully. Our case brings the total to five, and, as far as we can discover, ours is the only case in Britain that has been operated on. By means of an exploratory incision, a flood of light was thrown on the subject. We discovered that there was no stone in any of the ducts within reach, viz:- the common, cystic, and hepatic. The surgeon's next step was to fix the base of the gall-bladder to the edges of the abdominal wound. After opening the gall-bladder, he explored its interior. The mucous membrane was apparently normal. He found a quantity of blood-clots with some bile. Thus the base and body of the viscus were not the source of the haemorrhage. Investigation did not proceed further. The surgeon did not detect any pulsation in the neighbourhood of the duct where the lesion was found on post-mortem examination. Some

OPERATION

 and
 LIVING
PATHOLOGY.

 Continued.

writers mention this, and explain it by the fact that the walls of the aneurysm contain several laminae of blood-clots, as in this case. One writer discovered the tumour only by passing through the cystic and common ducts a sound which was arrested by the pressure of the tumour. In our case blood laminae lined the wall of the aneurysm, and this is probably the reason why the surgeon did not detect the pulsation. The surgeon, however, was wearing rubber gloves, which may to some extent have interfered with fineness of touch. The presence of the blood-clots suggest to us the cause of the paroxysmal pain, viz:- the contraction of the gall-bladder to expel the blood-clots. There was apparently no bleeding for several hours previous to the operation, but after the operation, when the patient recovered from the anaesthetic, there was severe bleeding, which was checked with great difficulty. We would infer from this that the gall-bladder was in communication with some large blood vessel, and the only possible conclusion at which we could arrive was that the haemorrhage was emanating from an aneurysm. As the only large bloodvessel in the immediate neighbourhood was the hepatic artery, we inferred that the aneurysm was on that artery. Thus we had indication of the proper treatment, viz:- to ligature the artery, proximal to the tumour.

PATHOLOGICAL

 ANATOMY.

There are two kinds of hepatic aneurysm, extra hepatic and intra hepatic. The aneurysm may be single or multiple. Of the cases recorded sixty per cent were extra, and twenty per cent intra. In two cases where the aneurysm was multiple, one aneurysm was intra-hepatic, and the other extra-hepatic. In fifteen per cent of the cases the situation of the aneurysm was not stated. In forty per cent of the cases the main vessel was involved; in thirty per cent the aneurysm affected the right branch; in eight per cent the left was affected. In eight

PATHOLOGICAL

ANATOMY.

Continued.

per cent there was an aneurysm on each of the branches. In three per cent the aneurysm was on the cystic branch. Only two writers on this subject mention that the aneurysm in their experience was of the false variety. In eighty per cent of the cases the sac was ruptured; fifteen per cent were unruptured; in five per cent the condition of the aneurysm was not stated. Of the cases in which rupture occurred, fifty per cent took place into the peritoneal cavity; forty-one per cent into the bile-passages; and ten per cent into stomach, duodenum, and portal vein. One case of spontaneous healing has been reported by Ledieu, due to thrombosis, the patient having died of renal disease without the occurrence of any symptoms of hepatic aneurysm. Osler and Ross reported a case in which the symptoms were those of pyaemia, and the liver was found on post-mortem examination to contain multiple abscesses. The extra-hepatic are generally larger than the intra-hepatic. The size varies markedly, e.g., from size of a child's head, as recorded by Wallmann, to that of a barley-corn, as recorded by Rolland. The average size equals that of a hen's egg. In our case the aneurysm was on the main artery in the lesser omentum, i.e., on the anterior wall of the foramen of Winslow; the size was about that of a pigeon's egg.

In eighty per cent of the cases the aneurysm was single; in one case there is no record whether the aneurysm was single or multiple. In thirteen per cent two aneurysms were found. In five per cent there were three aneurysms. In three per cent there were several aneurysms. In intra-hepatic aneurysm, when rupture occurs into the peritoneal cavity, the liver substance is lacerated.

PROGNOSIS.

In all cases the prognosis of aneurysm of the hepatic artery is very grave. Where the lesion ruptures into the bile-passages, and where the bleeding is recurrent,

PROGNOSIS.

Continued.

with the advances of modern surgery, the prognosis would now be more favourable. If, on operating, the diagnosis is found to be correct, the lesion can be rationally treated.

DURATION.

The average duration of aneurysm of the hepatic artery is given as three and a half months. In our case the condition lasted for slightly over two years.

TREATMENT.

Medical treatment is of use only to alleviate the symptoms, while the patient is being prepared for operation. Beyond this, surgical treatment alone is rational. Anatomists have demonstrated that provision is made for the collateral circulation of the liver. The indication is for the surgeon, when he has discovered the lesion, to tie the vessel, or excise the aneurysm.

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