AN ADDRESS ON PANCREATITIS.

Delivered before the American Surgical Association.

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HAVING expressed my views on chronic pancreatitis and its relation to cholelithiasis at the London Polyclinic in June, 1900, and having been invited to open the discussion on Diseases of the Pancreas at the International Medical Congress in Paris in August last, I almost regretted having promised to give this paper before the American Surgical Association, lest it might appear as if I were simply giving a *réchauffé* of my views, but it is astonishing how much has recently been written on the subject. Not only have my observations been confirmed by numerous workers who have expressed their views in writing, but from conversations I have had with many surgeons who are frequently operating on the abdomen, I find that nearly all have had one or more cases diagnosed as gall stones in the common duct for which they had operated, but, finding a tumour of the head of the pancreas, they had simply drained the gall bladder and given a bad prognosis, thinking the disease to be cancer.

Only on the complete recovery of the patients had wonder been excited and some other explanation sought for. Moreover, my own experience has been increased, and as the result of further observations I have views to advance which will, I hope, produce a useful discussion.

I do not propose to weary by a recital of many cases, a number of which have been reported and can easily be referred to if wanted; but I should like to give what time I have to a brief consideration of the relation between fat necrosis and hæmorrhage; to the relation of gall stones and pancreatic disease, and to the treatment of pancreatitis generally.

SYMPTOMS AND DIAGNOSIS.

It is a curious fact that although surgeons have been removing gall stones from the common duct for a little over one hundred years, that is, since Courvoisier's first successful choledochotomy in 1890, and that although the subject of jaundice dependent on obstructed common bile duct received great attention from physicians many years ago, yet until comparatively recently it never seemed to dawn on the minds of clinical observers that whatever obstructs the common bile duct at its lower end must also of necessity lead to an obstruction in the pancreatic duct; and although, since the description of the disease by Charcot as intermittent hepatic fever, infective and suppurative cholangitis have been well recognised by pathologists, yet infective and suppurative catarrh of the pancreatic ducts has even yet received no place in the medical textbooks, which means in reality that all diseases of the pancreas except those producing gross organic changes such as cancer, acute pancreatitis, cysts, and calculi have been practically ignored, yet we know, both by *post-mortem* observation and by surgical experience, that under similar conditions the pancreatic ducts participate in the same inflammatory processes as the bile ducts.

When the common bile duct is obstructed the objective sign of jaundice at once demonstrates the fact; hitherto, however, no pathognomonic sign has been discovered which will show conclusively that the pancreatic ducts are occluded, unless it be the extremely rapid loss of weight. As is now well known, the presence of fat necrosis does afford some clue, and a very important one, only hitherto discovered, however, when the abdomen is opened. But, even for fat necrosis to take place there must probably have been some escape of the fat-splitting ferment from the gland, and therefore the affection of the pancreas must be somewhat advanced before the sign is evident. Glycosuria, lipuria, and fat in the stools occur too seldom to be of much use in the diagnosis of pancreatic disease, though when present they are of great diagnostic importance.

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I think that physiological chemistry may perhaps help us in the diagnosis, and though our observations are not by any means yet complete, I hope that some researches at present being conducted on cases under my care by my friend, Mr. P. J. Cammidge, Pathologist to the West Riding County Council, may prove of practical use, and I have some grounds for hope that by an examination of the urine alone or of the urine, the blood, and the fæces, that we may have some assistance in the diagnosis of these difficult cases.

The pancreas is a racemose gland well supplied with blood, and unlike the parotid, the lobules of which are well supported by fibrous partitions, its tissues are comparatively soft and easily bruised, so that although it is placed in the most favourable position for protection from direct injury, yet a slight injury takes more effect on it than on many other firmer organs, and we have experience of pancreatitis resulting from blows in the epigastrium apparently trifling in character, as in a case that I saw several years ago:

A butler slipped and fell forward against a knife board projecting from the end of the table at which he was working. The blow was comparatively slight, and the man did not even fall to the ground, but acute, so-called hæmorrhagic, pancreatitis followed, and the patient died, an exploration for peritonitis followed by a necropsy revealing the true cause of death.

Probably slight injury to the pancreas often occurs in abdominal operations for gall stones in the common duct, when it is sometimes necessary to manipulate and rather forcibly draw the parts in the neighbourhood of the pancreas forward in order to view the common duct when sutures are applied. Such a case has indeed been related recently.

When it is borne in mind that the pancreatic duct opens along with the common bile duct into the second part of the duodenum, a channel usually containing septic organisms, especially when it is the seat of catarrh, to which it is especially liable, it is not a matter for surprise that pancreatitis should be met with, but rather that it should not occur more frequently. As in the liver we may have simple, infective, and suppurative catarrh of the excretory ducts as well as inflammation of the interlobular tissues, so in the pancreas we undoubtedly have similar diseases which are only awaiting our recognition during life by greater diagnostic skill. As bearing on this, the pathologist of a large hospital has told me that in cases of obstruction of the common duct by gall stones, he has noticed that pus can usually be expressed from Wirsung's duct, and this has been confirmed by others. I feel sure that, as our means of diagnosis become more perfected, diseases of the pancreas, both functional and organic, will be more frequently recognised and awarded their deserved positions in medicine.

Since Dr. Walker, of Peterborough, showed that the absence of the pancreatic secretion from the intestine, even though bile was present in the intestinal canal, led to pale-coloured motions, very little attention has been paid to this sign, although much has been written about the presence of sugar in the urine in pancreatic disease; yet glycosuria is in my experience a very rare phenomenon in this relationship, and in fact it only occurs when there is great destruction of pancreatic tissues, as in extensive cirrhosis or in extensive malignant disease. Fat in the stools is more common, but not by any means universal, and lipuria is still more uncommon.

I have seen cases of discomfort, with some swelling of the epigastrium, associated with dyspepsia and ague-like attacks, but without jaundice, or with only very slight jaundice, which I thought might be explained on the hypothesis of infective inflammation of the pancreatic duct, the cases having cleared up under general treatment. I have also seen the same symptoms associated with more pain, irregular fever, more marked swelling and tenderness over the pancreas, and discharge of pus by the bowel from time to time, but without any collection sufficiently large to form a distinct abscess. I related a case like this in the lecture previously referred to, but the recovery of the patient made the absolute certainty of the diagnosis impossible, though an examination under an anæsthetic enabled a swelling of the pancreas to be felt, and this was confirmed by palpation of the abdomen at a later stage, when tenderness was less marked. I thought this case was probably a subacute pancreatitis associated with suppurative catarrh of the pancreatic ducts analogous to suppurative cholangitis.

CAUSATION.

The essential and immediate cause of the various forms of pancreatitis is bacterial infection, this having been positively proved both clinically in the human subject and experimentally in the lower animals, but as in inflammatory affections of the liver and bile ducts we look for extrinsic causes, so in pancreatic diseases we find biliary and pancreatic lithiasis, injury, gastro-duodenal catarrh, ulcer and cancer of the stomach, pylorus, or duodenum, and zymotic diseases, such as typhoid fever and influenza, to be determining factors, though in some cases pancreatitis has come on suddenly in persons in robust health, and the determining cause has been beyond recognition.

Though the infection may arise from the blood as in pyæmia, or by direct extension from the neighbouring tissues, as in ulcer of the stomach, yet the most usual channel is through the duct, as in the cases arising from gall stones in the common duct, and from gastro-duodenal catarrh, that I related in my lecture.

The association of gall stones with chronic pancreatitis was absolutely forced on my mind by the frequency with which I found inflammatory enlargement of the head of the pancreas when operating for gall stones in the common duct. The first instance observed by me in 1892 was in a case on which I operated for deep jaundice supposed to be due to common bile duct obstruction, but in which I found cirrhosis of the head of the pancreas. Since that time I have operated on a considerable number of cases (over 20), and though only one patient has died directly from the operation, in two others, one a cholecyst-enterostomy and the other a cholecystostomy, death occurred within a few months, and the correctness of the diagnosis was verified both by necropsy and by a microscopical section of the diseased pancreas. It is a simple matter to infer that if common-duct cholelithiasis can give rise to chronic pancreatitis, it will also be likely to induce the subacute and acute form of the disease, and this is, I think, now clearly proved. Dr. Kennan¹ described a case of acute pancreatitis ending fatally on the second day in a woman aged 38, and at the *post-mortem* examination a large number of gall stones were found in the common duct, one being partly extruded into the duodenum.

Körte² notes that lesions of the pancreas are frequently associated with diseases of the bile ducts. Lencereaux³ mentions the possibility that a gall stone impacted in the diverticulum of Vater may occlude the pancreatic duct and produce conditions favouring the entrance of organisms into that duct.

Dr. Opie, in a very instructive and interesting paper,⁴ relates cases—one of Dr. Osler's and several from various sources—showing the relation between pancreatic and gall-stone troubles.

Mr. Gilbert Barling⁵ has given several interesting cases bearing out very fully the views expressed above. In some of my cases gall stones were not found, but only old and firm adhesions, with an antecedent history of paroxysmal attacks, followed by jaundice, which afforded strong presumptive evidence that cholelithiasis had been present at some time; and it seems quite possible that temporary occlusion of the common duct, with the damming back of infected secretions, or with injury to the ducts, may set up a pancreatitis, which may itself then cause compression of the common bile duct, and so lead to a perpetuation of the obstructive jaundice and other troubles, started in the first instance by impacted gall stone.

FAT NECROSIS.

By fat necrosis is understood a splitting up of the fat into fatty acids and glycerine; the latter is absorbed, but, the acids, being insoluble, remain in the cells and unite with calcium salts, forming yellowish-white patches of various sizes in the subperitoneal fat and in the omentum, mesentery, etc. It was first described by Balser in 1882, but has been since investigated by Langehans, Hildebrand, Dettmer, Milisch, Williams, Flexner, Opie, and others. Experiments by Opie, who ligatured the pancreatic ducts in the cat, go to show that widespread fat necrosis may be expected to follow very rapidly.

Fat necrosis is commonly found in association with pancreatitis and other diseases of the pancreas, and the relation between the two conditions has given rise to much specula-

tion; but the fact that fat necrosis is not found in all acute pancreatic diseases, and that it has been noted during abdominal operations for other ailments, and in necropsies where there was no suspicion of pancreatitis, appear to show that the condition giving rise to it is not essentially a pancreatitis as suggested by certain authors; though these facts do not disprove that fat necrosis is essentially due to interference with the discharge of pancreatic secretion, and so to an escape of pancreatic fluid into the tissues, whence it may be taken up by the lymphatics or blood vessels. Flexner⁶ and others regard the fat necrosis as the effect of the fat-splitting ferment of the pancreatic fluid which has in some way escaped from the duct into the surrounding tissues. It is difficult at first sight to explain the patches of fat necrosis occurring at a distance from the pancreas, for instance in the pericardium, unless it be by absorption of the ferment and its diffusion by means of the lymphatics, though it is easy to understand, and it undoubtedly does explain the disintegration of the fatty tissues immediately surrounding the pancreas, and extending by continuity first to adjoining and then even to distant parts in the abdomen and thorax.

HÆMORRHAGE IN PANCREATIC DISEASES.

It is well known that local hæmorrhages into the pancreas may occur apart from injury and apart from any general hæmorrhagic tendency, and that although they may be recovered from, as shown by the remains of extravasated blood in the gland in persons dying from other diseases; yet such spontaneous hæmorrhages may lead to death from collapse either immediately or after some hours. Curiously this may occur in persons apparently in good health, and without any premonitory signs on which a diagnosis can be based, the only symptoms at the time being those of collapse with dyspnoea and feeble pulse. It is also well recognised that a hæmorrhagic condition coexists with cancer of the head of the pancreas. Some years ago I thought this to be altogether dependent on the cholæmia, until increased experience in operations on deeply jaundiced subjects has taught me that there is much less danger of serious hæmorrhage in patients jaundiced from gall stones than in those where the jaundice depends on pancreatic disease. In several cases of cancer of the pancreas on which I have operated, the bleeding has been the immediate cause of death; in one aged subject especially was this well marked after cholecystotomy for the relief of jaundice. Death occurred on the third day from collapse, and at the necropsy there was found extensive effusion of blood away from the site of operation and behind the peritoneum, extending into the loins around the kidneys, and into the cellular tissues beneath the diaphragm, the blood being in sufficient quantity to account for death; and though the bleeding had evidently arisen from the pancreas, there was no manifest vascular lesion to account for the hæmorrhage. In another case, sent to me in 1888 by Professor Clifford Allbutt, a cholecystotomy was followed by persistent oozing of blood from the interior of the gall bladder and from the stitch punctures, which resisted all then known remedial measures in the way of styptics, pressure, transfusion, etc., and proved fatal on the ninth day. In neither of these cases was there any peritonitis or other cause than the hæmorrhage to account for death. Now in another patient equally deeply jaundiced that I saw with my colleague, Dr. Churton, in 1889, but where the disease was dependent on cancer of the common bile duct above the entrance of the pancreatic duct, there was no hæmorrhage, although the patient survived several weeks and died from exhaustion due to the disease and to the suppurative cholangitis accompanying it. I could give many similar comparisons showing the difference between the behaviour of the blood in the two classes of cases. Before operating on these cases I now always administer calcium chloride in 30 gr. to 60 gr. doses thrice daily for from twenty-four to forty-eight hours previous to operation, and by enema in 60 gr. doses thrice daily for forty-eight hours afterwards; this is nearly always successful in correcting the hæmorrhagic tendency. The following case illustrates, as well as any case could, how the failure to give it after operation led to hæmorrhage and how its administration in heroic doses apparently saved the patient.

Cholelithiasis: Deep Jaundice: Chronic Pancreatitis: Duodeno-choledochotomy: Hæmorrhage: Recovery.
(Reported by Mr. Gough, House-Surgeon.)

Mrs. M. E. G., aged 38, was admitted to the Leeds General Infirmary on January 23rd, 1901.

History.—She had had typhoid fever in September, 1899, and she had never been quite well since. Shortly afterwards she began to suffer from biliary colic, though she had never been jaundiced till six months before admission, from which time jaundice had never left her. On December 24th, 1900, she became much worse, had very severe paroxysmal pain, accompanied by shivering and profuse sweats. From that time she lost weight very rapidly and the jaundice deepened. On admission the liver could be felt below the ribs, and there was a distinct fulness on deep palpation in the region of the pancreas.

From January 21st to the 31st she took calcium chloride in 20-gr. doses thrice daily.

Duodeno-choledochotomy was performed on January 31st. There was very little bleeding. A stone nearly as large as a pigeon's egg was removed from the ampulla of Vater which was laid open over a director introduced through the papilla at its opening into the duodenum. The head of the pancreas was felt to be much enlarged and hard. The incision into the ampulla was not sutured, but through it the common bile duct very much dilated was explored by the finger. The anterior wound in the duodenum was then sutured and the abdominal wound closed. A drainage tube was inserted through a stab wound in the right loin. The patient inadvertently did not have calcium chloride given in the nutrient enema as is usual in these cases.

After-History.—She did well till the morning of February 2nd, when the nurse noticed at 3 A.M. that the dressings were soaked with bright blood. The drainage wound was exposed, but no hæmorrhage was occurring there. On examining the abdominal incision blood was seen to be slowly oozing from it and the stitch punctures. One drachm of calcium chloride was at once administered by the mouth, and three stitches were removed; the surface of the wound was then seen to be oozing all over. It was packed with gauze soaked in tincture of hamamelis, and a firm dressing applied. One drachm of calcium chloride was given again in two hours, afterwards repeated in 30-grain doses every two hours for six times, it being then given thrice daily. There was no recurrence of hæmorrhage, and the patient made an uninterrupted recovery. The drainage tube was removed on February 4th, and she returned home within the month.

In this case Mr. Cammidge found the characteristic crystal in the urine, and an examination of the blood showed a very marked diminution in the blood plates.

These arguments are brought forward to show that there is some as yet ill-understood relation between pancreatic disease and serious hæmorrhage, but I cannot help thinking that it is a mistake to allow this fact to influence our views on the pathology of inflammation by adopting permanently the name "hæmorrhagic pancreatitis" in cases where there has been no bleeding, or no more than occurs frequently in inflammation of other parenchymatous organs, though it may be useful to retain the name for those cases of pancreatitis associated with well-marked interstitial hæmorrhage, and in which the disruption of the gland by the bleeding may be the direct cause of the inflammation.

I have recently read a very interesting paper⁷ by Dr. F. B. Lund, entitled, *Acute Hæmorrhagic Pancreatitis and its Surgical Treatment*, with a Report of Six Cases; yet, in remarking on the second case, the author says: "This case is notable for the absence of pancreatic hæmorrhage." In the fifth case there was the evacuation and drainage of a small abscess of the pancreas, and no evidence of hæmorrhage, and in the sixth case also there was apparently no evidence whatever of hæmorrhage. The title of the paper is surely a misnomer, yet other authors adopt the same nomenclature in the same indefinite manner. Dr. Flexner produced an inflammation of the pancreas associated with hæmorrhage within forty-eight hours by injecting the bacillus pyocyaneus and the B. diphtheriæ into the pancreatic duct in animals.⁸ Hlava also produced hæmorrhagic pancreatitis by injecting the B. diphtheriæ into the pancreas. Hildebrand⁹ suggested that the hæmorrhage in acute pancreatitis was due to trypsin. The facts concerning hæmorrhage in diseases of the pancreas, and the conclusions we have come to after carefully considering the whole subject, are:

1. That in certain diseases of the pancreas there is a general hæmorrhagic tendency which is much intensified by the presence of jaundice.
2. That hæmorrhage may apparently occur in the pancreas unassociated with inflammation or with jaundice, or with a general hæmorrhagic tendency.
3. That both acute and chronic pancreatitis can and do frequently occur without hæmorrhage.
4. That some cases of pancreatitis are associated with local hæmorrhage.

I think, therefore, that inflammations of the pancreas may be more conveniently and scientifically classified, like inflammation of other organs, as acute, subacute, and chronic; and that there is no reason to use the term hæmorrhagic pancreatitis except as a variety of acute pancreatitis, the hæmorrhage being merely an accident in the course of the disease.

PATHOLOGY OF THE HÆMORRHAGES.

It seems to me worth while taking into account that the glycerine set free in the tissues by the fat necrosis may possibly be the real cause of the local hæmorrhagic tendency in pancreatic affections, though our observations are not yet sufficiently far advanced to say that this is an adequate explanation of all the cases. While inquiring into the subject, I have become acquainted with certain very important facts bearing on the question. If glycerine in very small amount be injected into mice, it rapidly produces hæmaturia (Cammidge) or hæmoglobinuria, due to destruction of the blood corpuscles; and in certain cases in which glycerine has been used by gynecologists for the purpose of inducing abortion, and in others in which it has been injected along with iodoform for the treatment of tuberculous disease in the human subject, blood has also been noticed in the urine, sometimes in large quantity.

The blood conditions about to be mentioned may possibly serve to explain the general hæmorrhagic tendency in cases of chronic pancreatitis associated with jaundice, but behind that there must be some other cause not yet discovered. Can it be due to something absorbed from the pancreas into the blood, which only acts when the absorption has been occurring over a prolonged period of time? This matter seems to me to be worth attention, and it should be possible to prove or disprove it by experimental work.

In discussing these matters with Mr. Cammidge, he suggested that only a small amount of glycerine could obtain access to the blood as the result of fat necrosis. When the glycerine is set free and the fatty acids are saponified, it would become oxidised just like any other alcohol, and the oxidation products for which one would look would be an aldehyde, but the tests employed failed to demonstrate this.

In the course of these investigations, however, Mr. Cammidge found that if the urine was boiled for a short time with an oxidising agent, and then the phenyl-hydrazin test performed, an abundant crop of delicate yellow needles arranged in sheaves and rosettes was produced. The untreated urine gave no such result; normal urine, morbid urines from gout, etc., and, most important, bilious urine from patients suffering from simple catarrhal jaundice, gave also negative results. I may say also that some experiments performed on bile and bile salts yielded none of the crystals.

The number of cases is too few to allow one to more than suggest that it may prove useful as a diagnostic test in this class of cases, but it is also interesting to note that on one day I operated on two patients deeply jaundiced, in one of which there was chronic pancreatitis; whereas in the other, although there was a small gall stone in the common duct, there was no manifest enlargement or disturbance of the pancreas. Both urines were submitted to Mr. Cammidge, and without his knowing the history of either case he sent me word that the urine in the latter case (where there was no pancreatitis) gave negative results so far as the crystals were concerned, and that in the former case he was able to obtain abundant crystals.

An examination of the blood has also been made in a number of cases, with a view to ascertain if any information can be found to explain the hæmorrhagic tendency. Although glycerine may be present, Mr. Cammidge knew of no test sufficiently delicate to demonstrate its presence in the blood.

A histological examination of the blood showed in two of the cases a very striking diminution in the number of blood plates as compared with the normal blood. This diminution of the blood plates, whatever may be its cause, may possibly explain the general hæmorrhagic tendency in these cases.

TREATMENT OF ACUTE PANCREATITIS.

In acute infective pancreatitis treatment practically resolves itself into that of peritonitis, commencing in the superior abdominal region. The pain at the onset is so acute as to necessitate the administration of morphine, and the collapse will probably demand stimulants, which, on account of the associated vomiting, may have to be given by enema. In the early stages the symptoms are usually so indefinite that the indications for surgical treatment are not clear enough to warrant operation, and until the collapse has passed off no surgical procedure would generally be justifiable. The simulation of intestinal obstruction will probably

lead to efforts to secure an evacuation of the bowels and relief to the distension.

Just as in a perforative or gangrenous appendicitis an early evacuation of the septic matter is necessary to recovery, so in this equally lethal affection an early exploration from the front through the middle line above the umbilicus, or from behind through the left costo-vertebral angle, is demanded in order to evacuate the septic material and adopt free drainage.

The after-treatment will be chiefly directed to combating shock and keeping up the strength until the *materies morbi* both local and general can be thrown off. Even if no pus be found no harm should accrue by such an exploration, which can be made in a few minutes through a very small incision in the middle line above the umbilicus, if necessary with the aid of cocaine anaesthesia. After establishing the diagnosis by the anterior small incision and the introduction of a finger, the posterior incision, which must be a free vertical one in the left costo-vertebral angle, so as to permit the insertion of the whole hand if thought necessary, will enable the diseased organ to be very freely examined, and if necessary drained for the evacuation of pus and gangrenous material, thus involving no risk to the general peritoneal cavity and little danger of retained septic matter, as the drainage will be a dependent one.

TREATMENT OF SUBACUTE PANCREATITIS.

The subacute form of pancreatitis is more amenable to treatment, as the indications are so much more definite and there is more time for careful consideration; and though it has usually only been attacked when an abscess has formed, and is manifestly making its way to the surface, yet there is no reason why in some cases surgical treatment should not be adopted at an earlier stage. As in the acute condition, morphine may be required to relieve the pain, lessen the collapse, and support the strength.

Distension, if present, may also demand attention and may have to be relieved by lavage of the stomach and turpentine enemata, or by the administration of calomel by the mouth. Calomel is also of benefit by acting as an intestinal antiseptic, for which purpose it may be given in small repeated doses or in doses of 5 grs., followed by a saline aperient. As soon as the constipation is relieved, diarrhoea is apt to supervene, when salol and bismuth, with small doses of opium, may be given. If surgical treatment is decided on, a median incision above the umbilicus will enable the operator to palpate the pancreas and locate any incipient collection of pus, which, if practicable, should then be evacuated by a posterior incision in the left or right costo-vertebral angle; or if the posterior incision be thought impracticable, the collection of pus may be aspirated and the cavity opened and packed with gauze, which may be brought forward through a large rubber tube, which will in the course of from twenty-four to forty-eight hours establish a track isolated from the general peritoneal cavity. In one case I was able to do this, but the operation was undertaken at too late a stage to be successful, and though the patient lived two or three days afterwards, the evacuation of the pus seemed to make very little difference to the general septic condition previously existing, and death occurred on the fourth day from increasing debility. The method adopted had, however, been successful from the point of view of drainage, and the track of the gauze and tube had been isolated from the general peritoneal cavity. If a definite abscess form and approach the surface in front or in either loin, the treatment will be that of incision and drainage, as in the case of any other abdominal abscess. Of 5 cases on which I have operated, 3 recovered completely, 1 recovered from the operation but died a few weeks later from chest complications and debility, and the fifth case is the one just referred to.

The strength must be maintained by careful feeding and the administration of stimulants, and it will be necessary to keep a sharp look-out for further collections of pus and for subphrenic abscess or empyema, which on recognition will need treatment.

The following case of pancreatitis is so exceptional, both with regard to course and treatment, that I think it is worth relating.

Chronic Gastric Ulcer Eroding Pancreas: Pancreatitis: Abscess of Pancreas Bursting into Stomach: Vomiting: Impending Death: Posterior Gastro-enterostomy: Recovery.

On November 12th, 1900, I was asked by Dr. Mercer, of Bradford, to see

Mr. R., who was extremely ill, and supposed to be suffering from pancreatic disease.

Condition when First Seen.—I found the patient, aged 35, extremely emaciated, lying in a typhoid condition, vomiting extremely offensive dark-coloured pus and mucus mixed with blood. He was extremely feeble, and had a rapid, weak pulse, and a slight icteric tinge in the conjunctivae. A tumour could be felt above the umbilicus, which was tender to pressure. On distending the stomach with CO₂ great pain was produced and vomiting followed. The stomach was dilated, reaching on the left side to the level of the umbilicus. There was a little sugar in the urine with a trace of albumen, and the faeces contained free fat.

History.—There had been an elevated temperature for a few weeks, but this had become subnormal after the vomiting of pus. Pain after food and indigestion had existed for some months, during which time there had been steady loss of flesh; but recently, especially during the last month, the wasting had been very considerable. No medicine had done any good either for the relief of the vomiting or in controlling the horrible odour, which permeated the whole house.

Diagnosis.—A diagnosis of chronic gastric ulcer of the posterior wall of the stomach, with secondary ulcerative pancreatitis and abscess of the pancreas, was made, and gastro-enterostomy proposed as the only means likely to produce any chance of relief, but even that seemed almost hopeless. He was removed to a surgical home by ambulance, and the stomach was washed out carefully by Dr. Bertram Stevens. As showing the nature of the stomach contents, both the attendant nurses were made sick by the odour of the material evacuated by the tube.

Operation.—On November 18th, after enveloping the patient in cotton wool and administering strychnine subcutaneously, posterior gastro-enterostomy was performed, a bone bobbin being used. The operation was done as quickly as possible in order to save shock. The tumour felt before operation was found to be formed by stomach and pancreas firmly fixed together towards the pyloric end, but leaving the dilated portion free at the cardiac end of the stomach, so that no difficulty was found in doing a satisfactory operation, which was completed in twenty minutes.

After-History.—Saline subcutaneous injections and rectal injections were given and strychnine was freely administered, but for two days we had a great fight with death, apparently due to poisoning with the foul stomach contents. Hot water was freely given to induce vomiting on the second day, as the patient could not bear the stomach tube being used. This gave relief, and afterwards progress to recovery was uninterrupted. He rapidly gained strength and put on flesh, returning home five weeks after operation. His friends, who had despaired of his recovery, were astonished to find him so well. In April he was in such good health that he married.

THE TREATMENT OF CHRONIC PANCREATITIS.

Chronic pancreatitis must also be treated by abdominal section and drainage, but in this case the drainage is indirect and obtained by draining the gall bladder by cholecystotomy, cholecyst-enterostomy, or duodeno-choledochotomy. The exact line of treatment cannot be determined until the abdomen is opened, and for this purpose I prefer, as in all my gall-bladder operations, a vertical incision through the upper part of the right rectus, splitting that muscle to whatever extent is necessary in order to obtain a good view of the diseased region, and to afford plenty of room for manipulation. If a mere cholecystotomy on a distended gall bladder is necessary, an incision of one or two inches will usually suffice, but if the gall bladder be contracted or if the ducts have to be attacked, an incision of four to six inches will be required, and if the several layers of the abdominal wall are sutured separately there is no fear of subsequent hernia; this I can affirm by ample experience. It saves much time and much unnecessary dragging on the parts when operating on the common duct or duodenum, to have a free incision, and there is no retractor equal to the hand of a skilful assistant, who, with a flat sponge interposed between the spread-out fingers of his left hand and the viscera, will at the same time afford the operator a good view of the field of operation and with his right hand help in the further steps of the operation.

If the right costal margin or the edge of the liver be obstructing the view, another assistant may with advantage retract it, either by digital manipulation or by means of a wide retractor with a long handle, so that he can stand back a little and avoid embarrassing the operator. As a matter of experience I seldom find a second assistant necessary. A sponge in the pouch to the right of the common duct and one pushed down over the right kidney helps to catch all escaping fluids and to keep the peritoneum clear. When the ducts or the duodenum are opened, sterilised gauze pads are employed to mop up the fluid as it escapes, but none of these are allowed to remain even temporarily in the abdomen. When there are gall stones present, they should be removed, unless the patient is too ill to permit of the complete operation; but in every case drainage must be secured, if possible by cholecystotomy, as in nearly all my successful cases; moreover, the drainage must not be stopped before the bile has become healthy and not before the greater amount of bile is being passed by the bowel, which will be certain to occur

as soon as the swollen pancreas has subsided if the duct be otherwise clear of obstruction.

It might be thought that cholecyst-enterostomy would be an ideal operation in the treatment of these cases, but experience says it is not; for instance, in one of my cases the operation brought about so much relief that a cure was being anticipated, yet in the third month relapse occurred and death ensued, apparently simply owing to closure of the new opening between the gall bladder and duodenum.

In one of Mr. Barling's cases¹⁰ where the gall bladder was joined to the duodenum, he stated that although the symptoms were relieved enlargement of the pancreas persisted. The course and treatment of chronic interstitial pancreatitis is exemplified in the cases related in my lecture before the Polyclinic in June of last year. Possibly in some of these the manipulation of the indurated tumour may have detached calculi impacted in the pancreatic duct, though I was unconscious of it; but in others the relief of tension as the result of draining the bile ducts by cholecystostomy or cholecyst-enterostomy indirectly drained the pancreatic duct and thus led to a subsidence of the pancreatitis, then to an opening of the common duct by the relief of the tension, and so to a cure of the patient. The simulation of malignant disease of the head of the pancreas by chronic interstitial pancreatitis would make me hesitate to decline operation in any case of distended gall bladder where the patient is in a condition to bear it, or even in any case of chronic jaundice without distension of the gall bladder where the general health is deteriorating; as, though it should be recognised that if the disease be really malignant, very little good will be done and life may even be shortened or only prolonged for a short time, yet if the disease prove to be chronic pancreatitis a real and permanent cure may be brought about. If a calculus be felt imbedded in the head of the pancreas or impacted in the pancreatic duct it may be reached through the second part of the duodenum by laying open the papilla and exploring the duct, or by dividing the peritoneum passing between the duodenum and hepatic flexure of the colon and then cutting through the overlying pancreas on to the concretion. If the papilla common to the bile and pancreatic ducts be incised in the duodenum it does not require suture, and in the cases in which I have explored the ducts by the duodenal route there has been no serious hæmorrhage; the anterior duodenal opening only requires closing by a mucous and a serous suture. Drainage of the right kidney pouch for from twenty-four to forty-eight hours is advisable, though not always necessary, and this is best done by a stab wound at the most dependent part.

The results of treatment in this class of cases has been most encouraging, as out of 22 cases operated on only one died directly from operation, and in that case the patient's life was only very slightly shortened, since he was reduced to the last stage of exhaustion before a surgical opinion was sought. Of those recovering from operation, with the exception of two that died a few months later, complete and perfect recovery ensued. These results contrast very markedly with the surgical treatment of cancer of the pancreas, where nearly half the cases operated on have died directly as the result of operation, and in those who have survived life has only been prolonged for a comparatively short time.

Of the 3 following cases, 2 have not been previously reported:

Chronic Pancreatitis: Cholecystostomy: Cure.

Mr. D., aged 45 years, was brought to see me on March 17th, 1898. *History.*—He had been well up to twelve months before, when he began to have painful attacks at the pit of the stomach ending in vomiting, but not followed by jaundice until an attack on January 1st, 1898, since which time he had been deeply and continuously jaundiced. He had also from that time onwards had ague-like attacks, and two days before seeing me he had had within twenty-four hours three of these seizures, each accompanied by pain. Within a twelvemonth he had lost 2 st. 8 lbs. in weight.

Condition on Examination.—There was some swelling in the gall-bladder region but no tenderness. The liver was a little enlarged but the margins felt smooth. There was decided tenderness in the middle line just above the umbilicus, and on deep pressure the pain was considerable, and an indefinite fulness could be felt. The diagnosis of gall stones in the common duct was made, and an operation was advised.

Operation.—The patient was operated on at a surgical home on March 30th, when the gall bladder was found to be slightly distended, and surrounded by adhesions to the pylorus, duodenum, colon, and omentum. No gall stones could be discovered, but there was a well-marked swelling of the head and the first 2 inches of the pancreas, which, though nodular and irregular, was not very hard. This extended further

to the right than normal so as to cover in the lower end of the common bile duct. Cholecystostomy was performed. Within twenty-four hours of the operation nearly four pints of very offensive bile were discharged through the tube. A specimen was examined by the Clinical Research Association, and their report was as follows: "The bile contains both staphylococci and streptococci, but no bacillus coli communis could be found either under the microscope or in the culture."

After-History.—Fearing that the disease might be malignant and the patient being so extremely weak and ill I gave a poor prognosis, but in a few days I was able to write: "The patient is progressing very satisfactorily, though he is still profoundly weak. Bile has appeared in the motions so that the obstruction is evidently overcome. The bowels have been moved naturally and the patient is less deeply jaundiced and looking better generally." On April 5th I was able to report that he was taking food well and that bile was passing freely in the motions. He had had no recurrence of the shivering attacks. The drainage was continued for fourteen days. On the 20th the patient returned home. The urine was then free from bile and the motions were assuming a natural colour; he was taking food well, gaining flesh, and looking better generally. I still, however, gave a guarded prognosis, though I said that I hoped that the tumour would prove to be inflammatory and not malignant. From that time onward his progress to recovery was extremely rapid. A report I had of his condition from his medical attendant a few months later said that he was perfectly well in every respect and that he had fully regained his lost weight. On March 28th of this year I had a letter from Mr. D. on the third anniversary of his operation expressing his gratitude and saying that he was in perfect health.

Chronic Pancreatitis with Abscess associated with Gall Stones: Cholecystostomy: Relief: Death Four Months later from Exhaustion: Necropsy.

Mr. H., aged 40, was seen by me with Dr. Woods of Batley on October 11th, 1900.

Condition when First Seen.—The patient was then deeply jaundiced and extremely ill, suffering from continuous fever, with exacerbations, great debility, and extreme emaciation. A large tumour in the region of the pancreas could then be felt as well as a distended gall bladder.

History.—He had been failing in health for nine months, and gave a history of gall-stone attacks and painful indigestion for some time before that, but, although he had had frequent attacks of abdominal pain for three or four months, the jaundice had only supervened a fortnight before my seeing him.

Operation.—He was too ill to bear a prolonged search, and there were numerous adhesions around the tumour, which was made out to be a swelling of the pancreas; the gall bladder was simply opened and drained of a quantity of muco-pus. A quantity of pus was discharged from the drainage tube several days after operation, and this was repeated on two or three occasions, as if it came from a deeply-seated abscess. A large drainage tube having been used, there was a free discharge of bile, and a considerable number of gall stones were evacuated through it, thirty-three in all.

After-History.—Previous to the operation the patient was suffering from shivering attacks and a persistently elevated temperature, which subsided immediately after drainage was effected, and the temperature kept nearly normal throughout the remainder of his illness, it being normal in the morning, though there was usually a hectic rise each evening. He made slow though apparently steady recovery from the operation, and the pancreatic tumour diminished so rapidly that it was confidently believed to be entirely disappearing, it being only one-third as large as at the time of the operation. He returned home on December 14th, but he never really picked up strength, and, though there was no further elevation of temperature, he gradually got weaker, and died in February.

Necropsy.—At the post-mortem examination made by Dr. Woods, a tumour of the pancreas was discovered which was carefully examined by Mr. Cammidge and pronounced to be a chronic inflammatory tumour, and not new growth, the centre being occupied by pulpy material where the abscess had originally been. Nothing else was discovered, and there were no gall stones left either in the gall bladder or ducts.

Chronic Pancreatitis: Cholecystostomy.

On January 28th, 1901, Mr. E. R. H., aged 26, was sent to me from Malvern.

History.—He was deeply jaundiced, and told me that he had had jaundice since the age of 17, it having supervened upon a severe attack of what appeared to be biliary colic, he having had numerous seizures since the age of 14. For two or three years he had had severe ague-like seizures, and during that time lost very seriously in weight and strength; but during the past two years there had been no shivers, and also he had been free from the severe paroxysms of pain, though he had had slighter seizures, after all of which the jaundice became more intense. The patient only weighed 9 st., and all the bile was apparently passing in the urine and none in the motions. There was also some swelling in the region of the pancreas, slight enlargement of the liver, and a very decided enlargement of the spleen.

Operation.—Four days later the abdomen was opened by a vertical incision through the right rectus. The gall bladder was found contracted and surrounded by numerous adhesions. After the separation of these the ducts were carefully explored, but without discovering any gall stones. The head of the pancreas was found to be enlarged and very hard. As the obstruction appeared to be entirely due to the pressure exercised by the pancreas on the common duct, the gall bladder was drained.

After-History.—For a few days the jaundice was deeper. It then became gradually less until it almost disappeared. In ten days the stools became bile-stained, and have since retained their colour, though there has never been complete freedom from a tinge of jaundice in the skin. He returned home on April 16th, having gained nearly half a stone in weight. He looked and felt much better, and as a small quantity of bile was still coming from the tube it was felt desirable to retain it until the last tinge of jaundice had disappeared. From the first week of operation up to the present he has had no further pain, and has been able to take ordinary food and to digest it well.

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NOTES ON A MILD TYPE OF SMALL-POX (VARIOLA AMBULANS?)

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THE Dominion of Canada is now being threatened with, and in some places invaded by, small-pox from her neighbour, the United States. This in itself would hardly call for remark. Communication of infectious disease from one country to another is a very ordinary form of international courtesy. In the present instance, however, the outbreak of small-pox presents some unusual features. It began on this Continent several years ago in the United States, the Southern States especially. It has gradually spread northwards. Its origin is difficult to establish, either as to time or place, with any historical accuracy. It has been attributed by many to returning soldiers from Cuba or from the Philippines. But it is certain that it was prevalent in the United States before the beginning of the war between that country and Spain. The difficulty in tracing back its history is due in great part to the unusual mildness of the type. Many cases of it were diagnosed as chicken-pox, many as German measles. Many more were not reported to, or seen by, any medical man at all.

How extensive is the spread of the disease in the United States may be judged by the fact that the Public Health Reports published officially by the Government at Washington give a total of 11,964 cases as reported present in that country during the period of three months between December 28th, 1900, and March 29th, 1901.

How mild the type is may be judged by the fact that in these 11,964 cases, only 157 fatal cases are reported to have occurred. This would only be 1.31 per cent. Further, the number 11,964 may, for reasons given above, be taken as very much under the actual number of cases that have occurred, whilst the fatal cases were doubtless all reported. The proportion of deaths to cases was, therefore, in all probability considerably less than this 1.31 per cent.

It has been suggested that the mildness of the type is due to some meteorological condition. Against this theory is the fact that, during the period since its commencement, we have had at least one intercurrent outbreak of a very virulent form of the disease introduced from the Orient. It was quickly limited and stamped out. But in the score or so of cases that occurred, the mortality ran up to over 50 per cent.

The extreme mildness of the present disease has defied from time to time our efforts to prevent its entrance, and has rendered it unusually difficult to handle, control, and stamp out.

Severe cases of small-pox are, as a rule, too ill to leave their bed, and are eager to obtain medical attendance. This leads to notification, isolation, disinfection, and the vaccination of those who have been exposed to the infection. And so we have a reasonable expectation of limiting the outbreak.

But this type offers more difficulty to the Public Health authorities. There is as a rule but little initial fever, a very sparse discrete eruption, and no secondary fever. The patient is not usually confined to bed, or even to the house, and no medical man is called in. In the country parts it is very generally regarded and spoken of as a chicken-pox or German measles. In many of the lumber camps it goes by the name "cedar itch." Those affected by it go to their work or their business, travel in public conveyances, go from one part of the country to another, not only in the period of incubation, but often also in the early period of the eruption, and thus spread the disease generously and widely. We have had outbreaks of it in several of our provinces and territories from the Yukon to Nova Scotia. It is present in eleven out of the fourteen States of the United States which, from Alaska to Maine inclusive, border on Canada, with an aggre-

gation in them alone of 4,433 reported existed cases. It is present amongst us in several localities at this time.

There is therefore grave reason to fear its continuance and spread. Vaccination is not compulsory in Canada as a legislative enactment, although the municipalities have power to enforce it under certain conditions.

That this disease is small-pox is questioned by many. The following facts, however, in connection with it give a reasonable assurance that it is small-pox and not chicken-pox. It attacks adults quite as often as, or indeed more often than, children. It attacks the unvaccinated or those who have not been vaccinated for some time. It does not attack those who have been recently successfully vaccinated. Every here and there a susceptible person develops a severe confluent or even fatal case.

The threatening and even the presence of this mild form of small-pox interrupts and interferes more or less with trade and commerce, travel and traffic. It is not, however, an un-mixed evil. Many may pass through its lenient hands without much illness, pitting, or mortality. Many, very many more will be vaccinated for fear of it.

Between the two classes a large proportion of the people of Canada should be rendered immune to small-pox. And so for some years the Dominion may be safe from any severe epidemic of this disease.

NOTE ON THE PROBABLE RELATIONSHIP OF VACCINIA TO THE INOCULATED FORM OF SMALL-POX IN MAN.

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THE difficulty experienced by myself and numerous other investigators in attempts to transmit human small-pox to bovines, whether cows or calves, has not infrequently been cited as a reason for regarding with distrust the theory first expounded by Jenner, that cow-pox, whether carried through the horse as intermediary host or not, was originally derived from small-pox in the human being.

But a great deal, at any rate, of the small-pox which was prevalent during the time that Jenner lived and wrote was of that comparatively mild variety which, under the name of inoculated small-pox, was intentionally produced in healthy subjects, with the object of thereby conferring protection against subsequent attack by the disease in virulent form. So mild, indeed, at times were the results of inoculations in the hands of such operators as Adams and the brothers Sutton, that no obvious effect was observed, with the exception of the local vesicle arising at the site of insertion of the small-pox virus, and the patients suffered but little inconvenience. Many of them doubtless therefore would be capable of following their ordinary avocations, which would hardly be possible in the case of persons contracting small-pox in the ordinary way, among whom the disease was apt to exhibit such virulence as to account for the death of perhaps 50 per cent. of those attacked.

Not only were the effects following on inoculation comparatively mild, but the disease in this form was intentionally brought into many country districts which otherwise might not have become invaded. In the light of these facts, it has for some time past been borne in upon my mind more and more convincingly that it was not improbably from the inoculated form of small-pox rather than the ordinary variety that much of the cow-pox, in the prevaccination era, was derived. It is not difficult to understand how that the cracks so often found on the udders of a cow might become infected by a milker with fingers contaminated by contact with the inoculation sore upon his arm.

I determined, therefore, if possible to put the matter to the test, and learning that in Nubia and in certain parts of India the inoculation of small-pox is still carried out, I made numerous endeavours to obtain the necessary material, but unfortunately without success.

In default of inoculated small-pox in the human subject, I made trial of the monkey, which my previous work had shown to be readily susceptible to the disease, the various phases of