THE DIAGNOSIS AND TREATMENT OF CHRONIC GASTRIC ULCER.*

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[With Special Plate.]

AROUND the subject of gastric ulcer a very extensive literature has accumulated. Every country, and a host of authors, have contributed to it, until there must be many who doubt whether anything really fresh or important remains to be said. Yet I hold a firm belief, based upon an experience the length of which I dread to contemplate, that no small part of what is written requires ruthless revision in the light of the modern methods of inquiry conducted by the radiographer and the surgeon. The wealth of teaching in the textbooks is too often impersonal, and represents rather a legacy flowing from one's ancestors than a fortune newly won by hard endeavour. The heritage in respect of gastric ulcer is heavy enough, but not all of the securities are worth their face value.

A gastric ulcer is, of course, an ulcer occurring in the stomach. During development the stomach is differentiated as one part of the foregut from that other part which forms the duodenum as far down as the ampulla of Vater. The foregut terminates at the point of entrance of the ducts of the liver and pancreas; at the end of the second month of fetal life the pylorus marks off the stomach from the duodenum. When development is complete it is as a rule easily possible in all periods of life to distinguish the stomach from the duodenum. On palpation the pyloric muscle and valve are felt at once. Exactly in the line of the pylorus a thin white line is to be seen on careful examination; the line becomes clearer if in the living subject the pylorus is held forward by a finger and thumb placed one on the stomach, the other on the duodenum, and closed to meet in the pylorus. In close proximity to the "pyloric white line" is a vein, the "pyloric vein," which begins at or near the middle of the anterior surface of the pylorus and runs downwards to the greater curvature. The "pyloric vein" is constant, its arrangement variable. It may be single and large, short and branched, or long with only very slender branches; it may be double; it may or may not be met by a smaller vein running up towards the lesser curvature; it may lie on either side of the pyloric white line. The perfectly fair criticism has been made against the acceptance of this vein as a landmark, that veins are very irregular in their arrangement, position, and distribution, and that nowhere else in the body is the position of a vein so constant as this is asserted to be. And it must be frankly admitted that there is a very small number of cases in which the venous arrangement is such that no accurate localization of the pylorus is possible from a surface inspection. But there is no landmark in the body that is invariable. For many years past I have drawn the position of this vein as seen during an operation while the parts were under inspection, and it is quite safe to say that in at least 90 per cent. of the cases the markings I have mentioned may be accepted as accurate. Latarjet (*Lyon Chirurgical*, 1911, vi, 337), after a research conducted for the purpose of deciding the value of the vein as an accurate landmark, concludes in favour of its acceptance.

An ulcer occurring on the proximal side of this vein is a "gastric ulcer"; an ulcer occurring $\frac{1}{2}$ in. or $\frac{1}{4}$ in. or more beyond it is a "duodenal ulcer." It is not merely a matter of academic interest to distinguish them; their symptoms are sufficiently distinct to allow an accurate diagnosis of duodenal ulcer to be made with remarkable constancy; their complications and sequels in respect of perforation and haemorrhage are very different; cancer develops often upon the base of a gastric ulcer, and almost never upon the base of an ulcer in the duodenum. Gastric ulcer is a disease of comparative rarity; its diagnosis from the clinical evidence alone is difficult; its mimicry by other conditions extremely frequent. These statements may not find a ready acceptance everywhere. For if the textbooks of medicine, or the special works of distinguished authors

are read, or if the diagnoses made in the out-patient medical clinics are reviewed, it will be found that there is a general agreement that gastric ulceration occurs frequently, and that its symptoms are of a kind hardly admitting of doubt or difficulty in diagnosis. I have spent a great deal of time in reading almost everything to which I could obtain access that has been written about gastric ulcer, and I am compelled to say that when the statements universally made are tested by the experience gained in the operation theatre they are found to be inaccurate. My contention is that a full, clear, and truthful description of the symptoms of gastric ulcer is rarely given; and that the conditions described as "gastric ulcer" are in the majority of cases indicative of other diseases.

What are the symptoms of gastric ulcer, and how may the diagnosis be made?

Ulcer of the stomach occurs twice as often in men as in women; its chief symptom is pain. All the attributes of this symptom merit and must receive the closest scrutiny. The chief attribute is, I think, regularity. In all cases of gastric ulcer there are periods of intermission, longer or shorter, at one period of the year or another; but when the attacks are present the pain which is then the chief feature always displays regularity. It comes after all meals, even light meals; it is not present after breakfast on one day, after dinner on another, and absent entirely on another day. If a meal is eaten, pain during the attack follows invariably. The interval between the taking of the meal and the onset of pain is fairly constant. As a rule the earlier the pain is felt after a meal the nearer is the ulcer to the oesophagus. That is to say, if pain comes, regularly, one or one hour and a half after a meal, the ulcer that causes it is in the stomach, it is a "pre-pyloric" ulcer. If pain comes two, three, or four hours after a meal the ulcer lies generally beyond the pylorus. This period of relief from pain after a meal is constant and invariable, both in gastric and duodenal ulcers, until stenosis, subacute perforation, or the formation of crippling and embarrassing adhesions takes place. These conditions may lead to a delay in the time of the appearance of the pain in cases of gastric ulcer, or to the hurried appearance of the pain in cases of duodenal ulcer.

In over three cases in five of gastric ulcer, seen during operation, the pain came within one and a half hours of the taking of food; in rather more than four cases in five of duodenal ulcer the pain appeared two hours or more after food. The pain in cases of gastric ulcer very often disappears after an hour, or even less, and may be completely relieved, indeed it generally is, before the next meal is due. The pain of duodenal ulcer, on the other hand, appearing later, generally persists, often with a slowly increasing severity, until the meal is taken. The character of the meal influences the pain. A generous meal of heavy foods causes severe pain to appear at an earlier time in gastric ulcer; it delays the appearance of the pain in cases of duodenal ulcer. Smaller meals of soft, pulsatious food, easy of digestion and easily propelled, produce less pain, and the interval of relief brought by the food is longer. An indiscreet and hasty meal, especially of fruits, or salads, or pastry, may give instant and grievous pain. A bland and blameless diet taken in small quantities at brief intervals may reduce the chances of pain appearing, or even afford complete relief. In a small proportion of cases pain may not be influenced by food in the manner and to the extent now described. When the ulcer is near the cardia there may be no relief from taking food, or pain may immediately be made worse; each of these features is present in approximately 4 per cent. of the cases.

The pain is variously described: it is a deep, "boring," "burning," or "aching" pain; there may be "gnawing" or a sense of acidity and a desire for food or warmth. The pain in a majority of cases is said to be on the left side or high in the epigastrium; in some severe types there may be great complaint of pain in the back. In twenty-three cases in which there was a deep excavation in the pancreas consecutive to a subacute perforation of the ulcer on the lesser curvature or posterior wall of the stomach, seventeen patients complained bitterly of the intolerable aching in the back. As we know, many patients attacked with acute pancreatitis suffer most from pain in the back, and it is an old observation and an accurate one that a deep eroding ulcer of the pancreas may also produce this most distressing symptom.

* A paper read at the opening of the session of the Harveian Society, October 23rd, 1919.

The position of the ulcer, its freedom from adhesion to neighbouring parts, and its size, all seem to affect the type of pain, its periods of latency, and its time of onset after meals. When ulcers are small and seated high up on the lesser curvature, or just on the posterior surface, the symptoms are shorter in duration, but more prone to recurrence. They are often, as we learn from the radiographic examination, attended by severe forms of local spasm, which are responsible for the sensations of distension, weight, and pressure, which appear to accompany these ulcers more often than those of other types. If the ulcer is large, excavating the liver, or burrowing deeply into the pancreas, or if it is fixed by firm broad adhesions to the abdominal wall or the liver, the symptoms are less likely to show those intermissions which are so characteristic of the earlier stages. If, therefore, in the history of an individual case we learn that the periods of freedom from suffering have become by degrees shorter, and have finally vanished, we may often predict that some of the conditions named are present. If, in addition, there are wasting and especially anaemia, we may be very suspicious of the onset of malignant disease.

Relief from pain is obtained not only from food, but from alkalis, sodium carbonate, "mint drops," or from vomiting. Lavage of the stomach often gives great temporary relief.

The fact that the severity of the pain is so often mitigated by food accounts for the fact that many patients do not lose weight, or may actually gain weight during an attack. Patients with gastric ulcer recognize that heavy meals three times a day bring their own punishment. Lighter meals are taken at shorter intervals, and the total amount of food, much of it of high value, is accordingly far greater than that usually consumed. Weight is therefore gained.

About one-fifth of the patients who are found to have gastric ulcers complain not only of pain, but of great prostration, feebleness, or lassitude coming on just at the time when the pain is due. On close inquiry this most distressing symptom may be found to have preceded the experience of pain by weeks or months. The periodicity of the two is identical.

It is not possible to emphasize unduly the importance of ascertaining all these various modifications of the one symptom pain. The constancy of the sequence—food, comfort, pain; food, comfort, pain—is the most important of all the clinical matters concerned with the diagnosis of gastric ulcer.

The next symptom in point of frequency is *vomiting*. In all forms of ulceration of the stomach or duodenum vomiting is an inconspicuous feature, unless obstruction has developed as the result of the cicatrization of the ulcer. Indeed a degree of obstruction which is by no means trivial may be present, and yet vomiting is very infrequent or entirely absent. It is no uncommon experience to hear a patient say, "I never vomit," and for an operation to disclose an extensive ulcer or a moderate degree of stenosis in the body or near the pyloric orifice of the stomach. Patients seem to have a great capacity for estimating the degree of tolerance possessed by the stomach, and of taking only such foods, or foods in such measure, as will arouse no resentment. In the earlier stages of the development of their malady vomiting is not seldom self-induced in order to ease the stomach of a heavy load, and a sense of pressure and distension. But a very little experience seems to teach the greater number of patients the quantity of food that is appropriate for them. Thereafter vomiting occurs quite infrequently. It has probably been present on a few occasions in more than half the number of patients who have suffered in many attacks; but it is rare to find that quick reference is made to it when the history is being disclosed.

When in the record of any patient suffering from "dyspepsia" there is a story of frequent vomiting, of the inability of the stomach to tolerate the presence of any foods, of even fluid nourishment sparsely taken being at once rejected, the thought that gastric ulcer is the cause should be driven from one's mind. That type of history, which is commonly heard, is, I find, rarely present in cases of organic disease of the stomach. The vomiting due to the presence of an ulcer is infrequent, and occurs almost always not immediately after food, but after a shorter or longer interval. The meal at first causes relief, and only after that period of relief does it cause disturbance.

Haematemesis also occurs far less commonly than is supposed. Haemorrhage manifest as melaena, or in the vomit, is recorded in less than 25 per cent. of my cases; in the majority of these the amount of blood lost was trivial, and of many in which "haematemesis" is recorded it is at least doubtful whether blood was, in truth, present. I think it is true to say that when blood is discharged from the stomach either in a fresh state or as "black vomit," it is commonly believed that a chronic ulcer is present. There is a great fallacy in such opinions. That gastric haemorrhage occurs, and occurs profusely, in ulceration both of the stomach and duodenum is certain; but the number of other conditions that give rise to haemorrhage is so large that the possibility of a gastric ulcer being the source of the blood should not be strongly, or exclusively, held. I have so often seen haemorrhage of the most abundant kind ascribed to "gastric ulcer" which was caused by such other conditions as splenic anaemia, cirrhosis of the liver, appendicitis, and other infective conditions within the abdomen, that in the elucidation of the cause of such a condition as profuse haematemesis I seem to turn to other possibilities than gastric ulcer in the first instance. It is true that there may be a confusion as to terms here. For when a patient dies of such haemorrhage a very close examination of the gastric mucosa may reveal the existence of tiny claps, or cracks, or fissures from which blood has certainly issued. And when in the old days of unwisdom we operated upon such patients and explored the cavity of the stomach the mucous membrane was said to "weep blood," little trickles of blood could be seen to issue from many points. But these little gaps in the mucosa are not ulcers of the kind that produce clinical symptoms. If a patient has suffered for months or years from dyspepsia, and then is seized with an acute attack of vomiting and haematemesis, and if an operation urgently performed reveals the condition of the mucosa I have just described, it is the worst of fallacies to connect the dyspepsia with the "ulcer" or ulcers then supposed to be present in the stomach. The ulcer which has caused repeated attacks of indigestion is always a gross lesion, a lesion in which there are present not only the evidences of destruction, but also of defence; around the crater of the ulcer is an area, greater or less, of inflammatory action, and the serous coat of the stomach is plainly involved. If the breaches of continuity which permit the escape of blood in cases of cirrhosis of the liver, splenic anaemia, and the toxic conditions which, as a rule, have their origin within the abdomen, are called "acute ulcers," as they often are, it is essential to remember that such ulcers are recognizable by no other clinical evidence than haemorrhage, or in exceedingly rare instances by perforation; they are never the cause of a continuing or recent dyspepsia. The relation between acute ulcers and the chronic ulcer which is so disabling is not certain. Dr. Bolton, whose work on *Ulcer of the Stomach* is the best of all books on its subject, believes that one is a sequence of the other. He is probably right. Yet, the acute ulcer as such gives no other clinical indication of its existence than haemorrhage or perforation. The diagnosis of "gastric ulcer" in these cases of grave haemorrhage was held to be confirmed by the after-history and the results of medical treatment. The patients regained health rapidly, soon lost their anaemia, and were able to take food without restraint. But everyone who has considered the history of cases in which there has been a copious haemorrhage from the stomach will agree that this rebound to full and vigorous health is quite common. It is so even in cases in which at a later operation a frank gastric ulcer is seen.

Such, briefly stated, are the symptoms of gastric ulcer. As will be realized, the chief dependence in making a diagnosis is placed upon the one symptom—pain. What are the other methods of investigation which can help us to a decision? Chief among them I now place the examination of the stomach after a barium or bismuth meal by x-rays. In this work I have relied upon my colleague, Mr. Scargill, and I am greatly indebted to him for his most careful and accurate work and for the skill which he shows in the technical sides of it. His methods, which follow closely upon those of R. D. Carman of the Mayo Clinic, show that the possibility of making an accurate diagnosis of gastric ulcer is greatly increased by the x-ray examination; that, indeed, the radiographic examination alone is more accurate than all other

Radiographs by Mr. H. B. Scargill illustrating Sir Berkeley Moynihan's Paper.

FIG. 1.—Very small "niche" type of ulcer on lesser curvature. Involves stomach wall only. No incisura seen in this case. Wire marks costal margin.

FIG. 3.—Ulcer crater on lesser curvature penetrating lesser omentum and adherent to left lobe of liver. Well marked incisura.

FIG. 2.—Ulcer crater on lesser curvature penetrating into lesser omentum. Well marked incisura on the greater curvature, almost bisecting the stomach.

FIG. 4.—Ulcer crater on lesser curvature. Incisura in this case is a little above the level of the ulcer.

Radiographs by Mr. H. B. Scargill illustrating Sir Berkeley Moynihan's Paper.

FIG. 5.—Ulcer crater on posterior surface near lesser curvature, only seen when stomach was almost empty. At operation found adherent to pancreas.

FIG. 7.—Groove-like ulcer on the lesser curvature $1\frac{1}{2}$ in. long. Very well marked spasmodic hour-glass contraction. No hour-glass at operation.

FIG. 6.—Huge ulcer cavity on lesser curvature penetrating left lobe of liver. The cavity was nearly $3\frac{1}{2}$ in. long.

FIG. 8.—Ulcer crater on lesser curvature with well marked incisura. (Dr. G. W. Watson's case.)

methods combined, and that a diagnosis which is proved by subsequent operations to be correct in indicating the presence of the ulcer or in demonstrating its size and position can be made in about 90 per cent. of cases.

The following is his method of examination: After a few hours of fasting, when the stomach is presumed to be empty, a bismuth or barium meal of thin consistency is given, and six hours later the first examination is made. By this time a normal stomach is able to empty itself of the small amount of opaque food administered. If a residue is seen, there is a delay indicating defective action. A second similar meal is now given and the stomach examined forthwith. The radiographic signs of gastric ulcer are:

I. *Direct*.—The ulcer cavity itself is demonstrated. If an ulcer has penetrated into the walls of the stomach, or eroded the liver or the pancreas, or perforated subcutely and become adherent to the abdominal wall, the crater of the ulcer can be seen filled with the opaque substance of a meal. If the ulcer is near the lesser curvature, it is visible in either an antero-posterior or semilateral view. If the ulcer is on the posterior surface the best view is obtained when the stomach is emptying. An ulcer on the anterior or posterior surface of the stomach close to the pylorus is more difficult to demonstrate.

II. *Indirect*.—In the majority of cases of gastric ulcer a very remarkable and sustained contraction of the circular muscular fibres of the stomach occurs in or near the segment on which the ulcer lies. An indentation of the greater curvature, of varying degree and extent, but often so considerable as to appear almost to bisect the stomach, is most clearly seen. Its appearance, whether on the screen or on a photographic plate, is remarkable. The spasm, in the majority of cases, remains stationary during the examination; it is unaltered by palpation, massage, or by the administration of large quantities of belladonna. It relaxes under a general anaesthetic, and is not seen on the operation table, the stomach wall being then quite soft and flaccid. A similar "incisura" is present as the result of extrinsic causes—causes lying, perhaps, remote from the stomach. The commonest excitants are duodenal ulcer, infection of the gall bladder, with or without stones, and chronic appendicitis. The spasm due to these causes is variable in position and duration, is modified by massage or pressure, and relaxes almost always after the administration of atropin given in an amount which produces a physiological response. It is also inconstant, present on one occasion, absent on another, and changes capriciously.

The presence of the persistent spasm is strong presumptive evidence of the existence of an ulcer; the presence of an "incisura" on the greater curvature, with a "bud-like" opaque projection on the lesser curvature, is an unequivocal evidence; in every such case an ulcer is present.

The radiographic method is the one certain method of diagnosis, and is now an indispensable addition to the older and far less accurate procedures.

Of the chemical examination of the stomach contents I do not speak with any enthusiasm. For several years my patients were submitted to this form of investigation, but I cannot think that the evidence thereby obtained enabled a greater accuracy to attach to the diagnosis or justified the increased trouble it gave to them. Hyperchlorhydria is present in so many other diseases than gastric or duodenal ulcer that its presence does not offer positive or even contributory evidence of any real value. In rather over 40 per cent. of the total number of cases in which an ulcer is present there is no hyperchlorhydria, and in a small number, estimated at from 10 to 20 per cent., there is a reduction in the gastric acidity. For reasons connected with the war I have rarely submitted patients to this form of inquiry in the last four years, but it will be interesting to discover the relationship, if any, between the degree of gastric acidity and the quality and duration of the gastric spasm due to extrinsic as well as intrinsic causes.

Physical examination, in the absence of obstruction in the body, or at the outlet of the stomach, reveals very little. There is a record of tenderness in the epigastrium in almost every one of the patients who are subsequently found to have an ulcer in the stomach. In ulcers of the lesser curvature I have sometimes found great tenderness high up on the left along the costal margin—tenderness

which becomes more acute when the patient breathes deeply. The kind of sensitiveness is then present on the left side which on the right establishes "Murphy's sign." The signs in pyloric obstruction, and in hour-glass stomach are, of course, well known.

If all the methods of examination are strictly brought to bear upon the cases commonly referred to as those of "gastric ulcer" it will be found that in a majority the diagnosis cannot be upheld. The diagnosis of gastric ulcer is loosely and inaccurately made; a host of other diseases, functional and organic alike, are so described, and in consequence the belief is widely held that "gastric ulcer" is a common disease. It would be more accurate to call it a rare disease. Over a series of years I find that for every gastric ulcer seen on the operation table, there are four or five duodenal ulcers, and five to six cases of cholelithiasis. A gastric ulcer is by no means easy to recognize even after the most scrupulous inquiry and examination. More mistakes are made in the diagnosis of gastric ulcer than is the case in any other abdominal disorder.

It must now be generally recognized that many of the diseases arising in connexion with the abdominal viscera are, for months or years, looked upon as cases of gastric disorder. I pointed this out a few years ago in two papers published in the BRITISH MEDICAL JOURNAL (October 18th, 1907, "Pathology of the living," and November 28th, 1908, "Inaugural symptoms"). Up to the time of the publication of these articles it had not been recognized that in cholelithiasis, for example, all the prodromal symptoms were attributed to defects in the stomach, and the medicaments administered were in consequence those used in gastric diseases. The same statement holds good with regard to chronic disease in the appendix, in the small or in the large intestine. We are now familiar, as the result of x-ray examination and of the chemical examination of the gastric contents, with the truth that all these conditions express themselves in terms of gastric disturbance, of hypersecretion, and of spasm. And at the time when operations are performed we can discover by inspection of the stomach such conditions as enable one to predict that a lesion will be found on closer manual examination, not in the stomach, but in the appendix or its neighbourhood.

If, for example, a patient has had a type of dyspepsia which has led to a diagnosis of gastric ulcer and an operation is performed, the stomach may show no scar; nor can any examination, however careful, display the ulcer whose presence was predicted. If, however, the stomach is closely inspected before it is handled the following conditions may be seen: The pyloric part of the stomach is decidedly redder than natural—there is a "pyloric blush." That part of the stomach is soon observed to contract eagerly and vigorously; sometimes the spasm is so severe and so prolonged that there may be a suspicion of a tumour, but by degrees the spasm relaxes, and the parts become supple again. The spasm may be irregular, now at one part, now at another; now slow and deliberate, now fugitive. Along the greater curvature the glands are enlarged. When these three conditions are seen the prophecy may be confidently made that the stomach is healthy and that the appendix (or one of its neighbours in the alimentary canal) is diseased. In such cases gastro-enterostomy has often been performed, sometimes, it is curious to note, with benefit, but as a rule with disastrous effects. It has been my lot to perform a secondary operation upon many such patients, and to remove a badly diseased appendix or to resect a tuberculous intestine, and perhaps to undo the anastomosis which should never have been made. The work of Cole, Barclay, Carman, and others explains quite clearly how it comes about that these intestinal disorders affect the stomach and cause its musculature to contract in the irregular and painful manner which raises the suspicion, or seems to make certain the opinion, that an ulcer is present. But there is also the infective element in such cases, as Wilkie has shown experimentally, and it is the toxæmia which is its outcome that leads, as Spencer and Hutchinson have shown, to profuse hæmorrhages from the stomach.

The stomach is an organ full of sympathy for other sufferers. Hardly any of the viscera connected with the intestine, or the bowel itself, can be affected without the stomach playing its part in the disturbance also. This it does by pouring out an excess of secretion, and by

tumultuous and irregular activities. It speaks so loudly that its voice only is heard.

The whole subject now briefly mentioned requires close and prolonged investigation. We must seek to find out as accurately as possible the clinical indication that will lead us to diagnose a veritable lesion of the stomach in certain cases, and in others to be able confidently to say that the stomach is intact, and that other organs are telling the story of their own disease in terms of stomach discomfort.

Differential Diagnosis.

The very great difficulties in the diagnosis of gastric ulcer are due to reasons which we can now fully appreciate. An ulcer of the stomach does not arouse symptoms merely because of the gap in one or more of the several layers of the stomach. We may be certain of this because, after an "attack" of gastric ulcer is over, and the patient is wholly free from symptoms, an operation may disclose the open crater of an ulcer large or small. The exact cause of the symptoms is uncertain, but, so far as we know at present, other conditions, in addition to the structural defect, must be present before the symptoms appear. These are:

I. Evidences of infection round the ulcer, such as induration, local peritonitis, the deposit of fat in and around the base of the ulcer, and enlargement of neighbouring glands. The "sentinal gland" of Lund is constant in cases of active ulceration.

II. Spasm of the musculature of the stomach. Of the presence, severity, and duration of this condition we had very little knowledge until the methods of examination by *x* ray became perfected, chiefly by R. D. Carman. We now know that a high degree of spasm is present and constant in examples of ulcer of the stomach, and present, though inconstant and variable, in those cases where there is no primary lesion in the stomach.

III. An increase in the acidity of the gastric juice. This hyperacidity is by no means constant either in gastric or in duodenal ulcer, but it is possibly a factor of importance in the awakening of symptoms.

These three conditions—infection, localized spasm of the gastric muscle, and hyperacidity—are all present not only in true ulcer of the stomach but also, in varying degrees, in most of those distant conditions which are able to arouse a gastric reflex; and it is their presence which causes that mimicry of the symptoms of gastric ulcer by other lesions which may be so exact as to deceive the most expert inquirer. My own strong feeling is that in order to obtain precision where so much has been vague, no diagnosis of chronic ulcer should now be confidently accepted unless the ulcer is diagnosed by *x*-ray examination or is displayed upon the operation table.

The diagnosis of gastric ulcer from a study of the clinical and chemical evidences alone is so uncertain; the various methods of treatment associated with the names of Lenhart, Leube, Cohnheim, Bolton, Sippy, and others, so helpful in all cases of infection of the alimentary canal, and the physical repose which accompanies the treatment so weighty an influence for good, that no certain conclusions can be drawn from even a long series of cases. What is needed nowadays to attest the value of medical treatment is an assured diagnosis of gastric ulcer before the treatment is begun. That has most certainly been lacking in the past. Of the methods of treatment, that laid down by Dr. Sippy of Chicago would appear to be the soundest, and to meet more fittingly the conditions in the stomach, which, it is thought, must be controlled before an ulcer has the chance to heal.

How great the difficulty in diagnosis really is could not be better shown than by a study of those cases in which the patients have been given over to the care of the surgeon for treatment, and in which the operation of gastro-enterostomy has been performed without benefit. There was a time when this operation was held to be the certain cure for ulcer of the stomach. If its "mechanical" virtues were not urgently needed because of the obstruction caused by the ulcer, its "physiological" effects at least would be salutary. A list of the diseases called "gastric ulcer" by careful medical men, often after consultation with others, and treated by operation, was considered by me in a paper in the *BRITISH MEDICAL JOURNAL* (July 12th, 1919). It is humiliating and heart-breaking to ponder over the mistakes in diagnosis which came to light in the records which were considered

during the preparation of that article. In many of these cases a diagnosis of gastric ulcer had been made on evidence that was considered adequate by careful practitioners. We cannot rid the matter of error until we realize how very difficult the diagnosis of gastric ulcer really is and until we decide that, no matter how confident the clinical diagnosis may be before operation, it shall not guide us during the operation too firmly. It is many years since I decided for myself that no gastric or duodenal ulcer existed unless it could be seen, felt, and demonstrated to a sceptical onlooker. It will help to a better understanding of the whole most difficult subject if in future no diagnosis of gastric ulcer is accepted, as a basis for treatment, unless the presence of the ulcer is made certain by *x*-ray examination or by operation. To accept the clinical diagnosis of gastric ulcer and to perform any operation upon the stomach without most clearly recognizing the ulcer is to court disaster. If the mistakes in diagnosis to which I have referred had been followed by medical rather than by surgical treatment, what would be the value of the experience derived from the cases in deciding upon the effect of similar treatment in veritable cases of ulcer? The truth is that we cannot state in terms of accuracy the results of medical treatment of gastric ulcer unless and until we are certain that an ulcer has been present. And as I have said the clinical evidences alone are very fallacious.

THE TREATMENT OF CHRONIC GASTRIC ULCER.

A. Medical Treatment.

I hope we may now agree that the results of the treatment of gastric ulcer by any of the systems already mentioned, or by any dietary or medicinal regimen, are vitiated by the lack of accuracy in the diagnosis of gastric ulcer. The most rational of all methods is that introduced by Sippy, which would appear to meet more combatantly those conditions in the stomach which we believe must be controlled before an ulcer can have the chance to heal. It is based upon a recognition of the fact that the reduction of the acid in the stomach is the first necessity. This is attained by dilution of food, alkalization of the gastric contents every hour, and by the administration of fats.

The questions which in this connexion require answer are:

1. Does a chronic gastric ulcer ever heal under medical treatment?
2. Does it long remain healed?
3. Does it heal without producing such conditions as need surgical treatment for their relief?

1. Chronic gastric ulcers undoubtedly heal under treatment or after the exercise of continued care in diet. The scars left by their healing are seen in the *post-mortem* room and, very infrequently, in the operation theatre. The discrepancy between the reputed frequency of gastric ulcer and the scarcity of the scars found in the dead-house has not attracted adequate attention. The number of healed cicatrices found in the operation theatre, when the stomach is examined as a routine in almost all operations, is very small. This may be due to the rarity with which sound healing occurs, or to the tendency of healed ulcers to break out afresh.

2. Do ulcers when healed long remain so? In the majority of cases the answer must be No. The characteristic quality in the symptoms of gastric ulcer is recurrence. There is a succession of "attacks," of changing severity and of variable length. The tendency on the whole is towards more serious attacks with briefer intervals. It is not by any means certain that an interval in which there is freedom from suffering means that the ulcer is healed.

3. When a gastric ulcer of moderate or large size heals there is inevitably some degree of contraction. In this way hour-glass stomachs are produced, and stenosis near to the pylorus. We cannot say with what frequency the successful medical treatment of a chronic gastric ulcer produces the conditions which need surgical relief, but it is certainly not seldom, for any large scar wherever placed, and especially if it has contracted adhesions to neighbouring parts, must embarrass the action of the stomach, or cause distress after food. Notwithstanding any or all of these considerations a really serious attempt to treat all cases of chronic gastric ulcer by medical treatment should be made. It is best to have no half-measures. It is at least arguable that the necessity for surgical relief

in many patients is due to a too perfunctory trial of medical treatment in the earlier attacks. The hospital accommodation in the country is too small to allow of the poorer classes receiving the rest and supervision that is necessary. The pressure on beds is too heavy. The ideal would be to keep the patient under treatment until an x-ray examination showed that the ulcer was healed.

B. Surgical Treatment.

When a chronic gastric ulcer has refused to heal, or has recurred, after medical treatment, surgical treatment is necessary. There is not yet any close agreement as to the procedure which is best adapted to the various types of cases, and there is not yet available a full record of the after-history of large groups of cases.

The operation of gastro-enterostomy is that which has been most frequently practised. Its success at first was wonderful, probably because only the cases of obstruction were then treated. Later its results appeared to be capricious. A small number of cases did well, a larger number were not satisfactory, some of the results were bad. The operation may be supposed to have two effects: a "mechanical" one, whereby the stomach is more readily drained, and a "physiological" one, as the result of which the gastric contents are alkalized by the escape into the stomach of the pancreatic juice and the bile.

If an ulcer lies near the pylorus, or is distal to the new opening created by the operation, the results are often good; food escapes more readily, and does not, in the same degree at least, come into contact with the ulcer; and the spasm excited by the ulcer disappears in many cases. But in some cases the ulcer will not heal, or if it heals breaks down again, and a further operation is needed. In such cases I have performed gastrectomy. In other cases the ulcer certainly becomes malignant after the lapse of two years or more. In one of my own cases, which I have formerly recorded, cancer occurred in the base of the ulcer treated by gastro-enterostomy thirteen years before. Gastro-enterostomy has also succeeded in cases in which the ulcer in the body of the stomach is of moderate size, and is free from any adhesion to neighbouring parts; but in many cases it has certainly failed. That this operation alone cannot be of complete value is shown by the fact that fresh ulcers can occur in the stomach after it has been performed for duodenal ulcer. I have operated upon two such cases. At the first operation in each the stomach was healthy. In both cases the ulcer was large and well away from the anastomotic opening.

There is a general agreement among those who have written upon the subject of the treatment of gastric ulcers that an important part of every method consists in counteracting the normal or the increased acidity of the gastric juice. If this effect is necessary, then the physiological effect of gastro-enterostomy must play some part in causing the good results that do certainly follow at times upon its performance. Whether the partial or complete neutralization of the acidity is necessary to healing is, however, by no means as certain as is supposed; for in cases both of gastric and duodenal ulcer hypacidity is sometimes found. According to Friedenwald a reduction of the acidity occurs in about one-fifth of the total number in cases of gastric ulcer, and in my experience in rather more than this proportion of cases of duodenal ulcer.

I have little faith in the "physiological" action of gastro-enterostomy. If the access of bile to the stomach with its alkalizing properties were proved to be of any value, it would surely be better to anastomose the gall bladder to the stomach, as I have many times done in cases of carcinoma of the pancreas causing obstruction to the common duct. The entrance of bile into the stomach in these cases causes no discomfort whatever. Those surgeons who rely on gastro-enterostomy alone in the treatment of gastric ulcers usually insist upon a protracted period of dietetic restriction, of rest, and of the administration of such drugs as the "triple carbonates." I am personally averse from the performance of gastro-enterostomy except in cases of existing or threatened obstruction—that is, in cases of duodenal ulcer, or, in special circumstances only, of prepyloric ulcer. The whole matter requires fuller investigation; the effects upon the healing of the ulcer and upon the spasm of the stomach, as judged by x rays, must

be studied and the late results of the operations carefully recorded.

Gastro-enterostomy may be combined with excision of the ulcer, or its cauterization (Balfour's operation); or the ulcer may be infolded in the manner practised after perforation occurs. Excision alone I have discarded, partly because the ulcers occasionally recurred, and partly because such a deformity of the stomach followed as not seldom necessitated a short-circuiting operation. Balfour's operation has many claims to favourable consideration. It destroys the ulcer crater completely; it gets rid, therefore, of the tissues in which carcinoma begins its development; it is simple in character, involves no great handling of parts nor any exposure; it adds little or nothing to the dangers of gastro-enterostomy alone. Local recurrence of the ulcer, so far as I am aware, has not taken place.

I saw the operation performed several times in Rochester, where the results were excellent. I have, however, practised it seldom, because I have felt that in the majority of cases of gastric ulcer it was better to perform partial gastrectomy. That appears to me the only way to make sure of curing the patient. There are, unhappily, certain cases in which gastrectomy cannot possibly be done—when, for example, in a patient who is ill and feeble and a "poor surgical risk," there is a large ulcer excavating the liver or the pancreas and extending up almost to the oesophageal opening. In such a case an almost complete gastrectomy would be necessary, and a fatal result would be probable. In some such cases also Balfour's operation may be practised. My own inclination is to perform gastro-enterostomy in "Y" and at the same time to introduce a tube into the proximal limb of the "Y," and through this jejunostomy opening to feed the patient exclusively for months or years until the ulcer is shown by a radiograph to be healed. As a rule I give nothing by the mouth; but perhaps bismuth and alkalis in large doses are helpful. In one case the patient took no food or drink by the mouth for thirty-three months. In this case the ulcer was the largest I have ever seen in any specimen, and the cure has been complete and permanent.

The advantages of gastrectomy over all other operations are that it does away, so far as our experience goes, with any chance of recurrence of the ulcer, that it results in a complete and immediate freedom from all gastric troubles, and that it banishes the danger—it may be large or small, but it certainly is real—of a cancerous change taking place in the base of the chronic ulcer. In the last forty specimens removed on account of simple gastric ulceration, three showed early evidence of carcinoma. It is true that in the majority of cases an accurate discrimination between simple and malignant ulcers may be made. But no one is competent always to judge rightly; and it is safer to decide by microscopical examination in a captured specimen than to learn of a mistake from the late issue of the case.

A Clinical Lecture

ON

HYPOCHLORHYDRIA AND AIR SWALLOWING.*

BY

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In a recent lecture I explained that for the true understanding of gastric and digestive disorders it was essential to begin their consideration from the functional side. I said that there were practically two types of functional disorder, and two only; that they were characterized by aberrations of gastric secretion, and that the chemical element at fault was the hydrochloric acid. The acid might be excessive, or it might be diminished in amount. I further explained the significance of the symptoms present in over-secretion or hyperchlorhydria; the results it often produced, such as atony, dilatation, ulceration, pyloric obstruction, and ptosis; while attached to it were such misleading terms as nervous dyspepsia, gastralgia,

* Summary of a clinical lecture delivered in the Royal Infirmary, summer term, 1919.