Remarks

ON

SOME POINTS IN THE TREATMENT OF GASTRIC ULCER.*

BY

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THE treatment of gastric ulcer has, during the past few years, probably given rise to more discussion than that of any other single disease, and many different lines of treatment have been advocated. It is, therefore, obviously impossible for me in the short time at my disposal to criticize all the different views which have been held. I shall only be able to touch upon a few points in the principles of the treatment in so far as they are affected by the little that we know of the pathology of the disease.

Series of cases treated by different methods are continually being published in order to demonstrate that this or that treatment results in the greatest number of cures. Thus gastric ulcer has been treated by starvation, by immediate feeding, by olive oil, gelatine, and other drugs, with or without external applications, and modifications of each treatment have been adopted by different physicians. In each case the advocate claims that his own method gives the best results. In some cases the average time spent in bed is shorter, in others relapses of bleeding are less common, in others again the average loss of weight during the treatment is less than occurs when other methods are employed.

Very few take into account the subsequent condition of the patient with regard to relapses of the symptoms. This discrepancy indicates that collections of cases of this sort are of relatively little value in comparing the efficacy of various modes of treatment. There are several reasons for this. The diagnosis of gastric ulcer presents great difficulties, and in a large number of cases is impossible. The disease is very variable, both with regard to the condition of the ulcer, its position, extent, and external adhesions, the associated gastric disturbances of motility and secretion, and the condition of the gastric mucous membrane with regard to the presence or absence of gastritis. Acute and chronic ulcer are usually not distinctly separated by the observer. The constitution of the patient must also be taken into account. As in health there are individual idiosyncrasies of diet, so in disease a diet suitable for one patient may be unsuitable for another.

I do not wish to imply that all the different treatments are purely empirical and that the statistics merely represent attempts to find out what a treatment selected at random is worth, because each treatment is apparently based upon one or more points which the originator considers to be of special importance in the pathology of gastric ulcer. But I wish to point out that this method of collecting and publishing statistics of cases leads to erroneous results, because different classes of cases which cannot be compared with each other are apparently mixed together. Each case must therefore be studied individually, the pathological conditions present first determined as exactly as possible, and the case then treated according to one or two general principles founded upon our knowledge of the pathology of gastric ulceration, suitable modifications being introduced at the discretion of the medical attendant to meet the requirements of each patient. I am sure that better results will be obtained in this way than if a special "cure" be adopted and applied indiscriminately to every patient as directed.

I will first indicate what conditions the physician is called upon to treat and how such conditions may be recognized.

We must first distinguish acute from chronic gastric ulcer. It is very probable that chronic gastric ulcer arises

from the acute variety, because occasionally transitional conditions between the two may be found. For instance, acute gastric ulcer may be considerably delayed in its time of healing, and it may also gradually extend. The records of such cases are difficult to collect, because the patients do not as a rule die, but it cannot be denied that there is a fair amount of evidence in favour of this view. Acute gastric ulcers vary in diameter from about the size of a split pea to an inch. They come before the notice of the physician either whilst they are in process of formation or when they are healing, and in either case profuse bleeding may occur. In fact an acute ulcer may be almost completely healed whilst bleeding from an open artery in the centre continues. It may be the original artery which was opened up during the formation of the ulcer and has continued bleeding, or it may have been opened later as the result of digestion of the centre of the base of the ulcer whilst the edges were healing. Acute ulcers are often called superficial erosions because they not uncommonly look quite superficial, although they extend down to the muscular coat. This is not to be wondered at considering that the thickness of the moderately stretched stomach is only about 4 mm. and the mucous membrane 1 mm. They are also often called fissures, because during healing an acute ulcer tends to contract up and form a radiating or a small depressed fissure-like scar.

An ulcer in the living stomach may look like a fissure and when slightly stretched assume the usual rounded form.

The tendency of an acute ulcer is to heal rapidly as in animals in a few weeks, and also to recur at intervals in the same individual. Such acute ulcers may quite commonly be diagnosed from chronic gastric ulcer, but, as in the case of most other diseases, the diagnosis may be quite impossible.

Acute gastric ulcer is commonly often latent and gives rise to no symptoms. Otherwise it announces its presence in one of three ways: (1) By a sudden perforation. (2) By sudden and profuse haemorrhage. (3) By pain and vomiting, with or without haemorrhage. As the ulcers tend to heal quickly, the symptoms last a proportionately short time.

The usual history of a *chronic* gastric ulcer is one of long-standing indigestion, with attacks of pain, vomiting, and haematemesis at intervals.

Since acute ulcers tend to recur in the same individual, the recurrences are usually diagnosed as relapses of chronic gastric ulcer, but attention to the following points will settle the diagnosis in many cases. There is no one point of distinction, so that the whole group of symptoms must be carefully studied. The pain is not so severe as in chronic ulcer, and it is not so commonly paroxysmal and independent of food, neither is it so liable to be continuous. Vomiting is commoner in the chronic form. Haematemesis in the acute disease is more liable to be profuse, to commence suddenly, and to cease suddenly. Hyperacidity occurs frequently in chronic ulcer; in acute ulcer the few estimations which have been made indicate that the acidity is normal or diminished. My own experiments on animals show that when an acute ulcer is in process of formation the acidity is diminished, but when it is healing the latter becomes normal. Wasting is only seen in chronic ulcer. Very long intervals between the attacks are in favour of recurrences of acute ulcer. Diminishing lengths of the intervals, and finally a condition of more or less constant pain and vomiting, are characteristic of a chronic ulcer.

Absolute freedom from symptoms during the intervals is in favour of acute ulcer, and the presence of some form of indigestion in favour of chronic ulcer. Of course the symptoms of indigestion may occur from time to time in a normal person, and they often precede the symptoms of an acute ulcer, but this point is certainly of value when taken in conjunction with others. Even though absolutely free intervals occur in chronic ulcer, it will often be found that the patient is unable to eat a full diet, and only keeps well by living on milk, eggs, and fish. In intervals between acute ulcers the patient can more often take any diet with impunity.

Acute ulcer is commoner in the young, and especially in women, although no age is exempt. Finally, transitional cases occur in which the patient may or may not have had a previous attack, but the duration of the symptoms

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is prolonged. Such cases are instances of acute ulcer, the healing of which is delayed or which is extending. Unhealed ulcers have been found more than two and a half months after the burns which caused them have healed, and many cases are recorded in which acute ulcers following burns have only given rise to symptoms some weeks after the burns have healed. The point I wish to emphasize is that at one end of the scale is acute ulcer, which usually heals rapidly; that at the other end is chronic ulcer; and that between the two are ulcers which, beginning acutely, heal slowly, or gradually extend, and some of which become chronic ulcers.

I should like to point out that the healing of acute ulcers may cause considerable deformity of the stomach, and that the character of the scar depends upon the size of the ulcer and the time it takes to heal, so that many scars which have been said to be those of chronic ulcers in the past have probably been those of acute ulcers, or of acute ulcers the healing of which has been delayed. I have gone into these points somewhat at length to show the great importance of acute ulcer, which I believe to be much commoner than is usually taught, and also to emphasize the fact that the more normally and the quicker an acute ulcer heals the less likely are there to be left those sequelae which necessitate surgical intervention.

Treatment of Acute Ulcer.

When an acute ulcer perforates, the case, by common consent, should be handed over to the surgeon at the very earliest moment, and success in the treatment of this condition must largely depend upon recognition of the earliest symptoms of perforation. Haemorrhage from an acute ulcer is, in my opinion, one of the most important conditions the physician is called upon to treat, and it is so common in this disease and so often the only symptom that it constitutes a definite type of the malady. It may or may not be possible to diagnose whether the ulcer is in process of formation or is already healing by the time at which haemorrhage has occurred during the course of the attack, but I do not think that this is of so much importance since the haemorrhage has to be primarily treated. Haemorrhage from an acute ulcer which is at all profuse is always due to perforation of an artery. The sudden cessation of the haemorrhage is due to plugging of the vessel with a clot. This clot may be interfered with by one of three factors: (1) The condition of distension of the stomach, which opens up and stretches the ulcer; (2) the alternate contraction and relaxation of the muscular coats of the stomach, which mechanically dislodge the clot; (3) the gastric juice, which digests the clot. Whether the clot be loosened or disintegrated, the blood pressure brings on a recurrence of the bleeding. Sometimes the wall of the artery may project almost beyond the level of the muscularis mucosae, and then the clot protrudes into the cavity of the stomach.

Such a condition is due to the movements of the stomach and the pressure of the blood in the artery. The aims of treatment in such cases should be: (1) To keep the stomach in the contracted state, (2) to prevent movements of the organ, and (3) to keep the digestive glands in the resting condition. In conditions where smaller amounts of blood are lost it must be impossible to say whether the bleeding is from smaller arteries, veins, or merely capillaries; but I think that in all these cases the same treatment should be employed. The patient should be kept at absolute rest in bed in the supine position and not allowed to move a muscle. Morphine should be subcutaneously administered in all cases of severe haemorrhage to assist in keeping the patient quiet. The mouth is to be thoroughly cleaned, and pain, if present, treated by morphine, and ice to the epigastrium. For the first twelve hours no feeding is attempted, but after this time has elapsed rectal feeds are started, consisting of peptonized milk and glucose every six hours, the rectum being washed out each morning. When the bleeding has been stopped for three days, mouth feeding is commenced and the rectal feeding discontinued. By stoppage of bleeding I mean not only absence of haematemesis, but also of fresh melaena, because as long as fresh melaena is present active bleeding is going on. A simple enema is given every other day as soon as mouth feeding is commenced, and at the end of a week saline aperients are commenced. I

have never seen a case of parotitis occur if the mouth be kept properly clean.

I do not employ rectal feeding in gastric ulcer in any other condition, because it means that the patient is on a starvation diet; but I think at all costs the stomach must be kept at absolute rest in the case of bleeding from an acute gastric ulcer, and it is not necessary to employ the method longer than for a few days. The time is usually so short that I hardly think it necessary to employ the subcutaneous method of feeding with blood serum or other substances. In this way the stomach is kept in the resting condition both with regard to movement and secretion. It has been stated and also denied that rectal feeding causes a flow of gastric juice. I think it is, at all events, likely that the blood in the stomach causes some secretion of gastric juice, and to overcome this difficulty I have allowed the patient to frequently drink lime water by teaspoonfuls. This alkali is preferable to sodium bicarbonate, which distends the stomach by liberation of carbonic oxide gas. The alkali neutralizes what acid is in the stomach and does not encourage further secretion. The movements of the stomach which are set up by this fluid must be minimal.

In four cases within the last few months at University College Hospital the haemorrhage of acute ulcers relapsed on commencing mouth feeding and led to the death of the patients. According to Lenhartz,¹ when feeding is started by mouth at once recurrence of bleeding only occurs in 6.4 per cent. of patients, but I do not see how it is possible to collect a series of cases in which haemorrhage is occurring under the same conditions. The giving of food by the mouth neutralizes what acid is present in the stomach, but it excites further secretion, and as a fact there is always in contact with the stomach wall a layer of freshly-secreted gastric juice which is about to soak into the food. This can be shown by giving a meal soaked in alkali. Although the main body of the food is strongly alkaline there is always a layer in contact with the stomach wall which is strongly acid in reaction, and this layer gradually deepens until the whole has attained the normal acidity. A digesting stomach is therefore in a condition to disintegrate the clot which is blocking the artery.

Muscular movements are also excited by food and these tend to dislodge the clot.

The icebag of Lenhartz, if it has any influence in diminishing the movements of the stomach, must thereby cause stagnation of the stomach contents, and a more prolonged action of the digestive fluids upon the clot. I believe that when the bleeding is slight mouth feeding could be commenced at once, but it is impossible to be sure of the size of the vessel, because in a case recently under my care a fair-sized artery was opened, and yet the patient only had coffee-ground vomit, so that I make the rule that in all cases of haemorrhage food should not be administered by mouth.

One cannot be altogether guided by statistics, when one sees actual cases in which bleeding breaks out two or three days after the administration of food. On the other hand I do not state that the patient never dies if fed by the rectum. My own experiments show the importance of the condition of the gastric glands upon the production of gastric ulceration. If the gastric juice be put out of action, ulceration fails to occur. If the stomach is digesting, ulceration produced in it is more marked than when the organ is resting. The presence of food in the stomach must, therefore, be harmful to a newly-formed clot. It is conceivable that the gelatine treatment of Senator might be of advantage if the bleeding came from the capillaries or small veins, but hardly in the case of serious bleeding from an artery. It does not appear to have found many advocates in England.

The older physicians placed great reliance on the various styptics, and later adrenalin has been used, but I do not think modern physicians use drugs at all largely. I do not myself. In severe cases saline solution, with or without glucose, is I suppose administered subcutaneously by most practitioners. The question of operation has been much discussed in relation to profuse haematemesis in acute gastric ulcer. A good deal has been written about it, and I think most surgeons are not greatly in favour of it. It may be stated as a fact that the vast majority of cases of haemorrhage from acute gastric ulcer recover, but that occasionally profuse haemorrhage proves fatal. I think

that fatal haemorrhage is more common than is usually supposed, judging from the opinions of various writers and from what I have seen myself.

Whatever is the exact mortality from haemorrhage does not matter, the fact remains that *sometimes* it *does* prove fatal. It is not the *first* haemorrhage which kills the patient as a rule, but *repetitions* due to dislodgement of the clot. I think all will agree that unless the haemorrhage is so profuse as seriously to threaten life, the case should be treated medically. It is impossible to give exact indications for operation, and each case must be regarded as an individual problem. Such very severe cases recover, that it is nearly always impossible to say that a given patient would have died if he had not been operated upon, and many physicians would not agree with operation in any case. We have three points to go on in dealing with a case: (1) Profuse haemorrhage is sometimes fatal; (2) in the particular case under consideration the bleeding has reached the danger point; (3) many similar cases are recorded in which the bleeding point has been secured and the patient has survived. The second point is the really difficult one, namely, into what degree of danger is the patient to be allowed to enter before the surgeon be called in.

The question of the mortality of this operation should be put aside in the consideration, as the case is naturally desperate. If a patient vomits two or three pints of blood, and after an interval, if the clot breaks down and a similar amount be vomited, I think the case should be operated upon. But it is quite common for a profuse haematemesis to be followed by smaller ones at intervals, or for continued melaena only to follow, so that clear indications may not exist. In doubtful cases the most important point is to be guided by the amount of the initial loss, as indicating the size of the ruptured vessel more or less accurately, the condition of the pulse, and the colour of the patient. With regard to the operation itself there is only one thing to be done—namely, to rapidly open the stomach and secure the bleeding point in the way which commends itself best to the surgeon.

The operation is done as a means of immediately saving life, and gastro-enterostomy is, of course, useless. The acute ulcer may not be found, as sometimes it is almost healed, or it may be very small and the vessel may not be bleeding at the moment. The surgeon must take his chance of this event. Acute ulcers may be multiple, but it is unlikely that an artery will be opened up in more than one of them, and the most important can, at all events, be dealt with. The bleeding being stopped, the next stage in the treatment is to put the ulcer under the best conditions for healing. The following remarks apply equally well to the treatment of acute gastric ulcer, whether haemorrhage has previously occurred or whether the case has merely come up with an attack of pain and vomiting which, from the history and state of the patient, is probably due to an acute gastric ulcer.

In whatever way the initial change is produced which leads to an acute gastric ulcer, we know that the subsequent course of events is greatly affected by the gastric juice. I have been able to show that gastrototoxic ulcers fail to appear at all if the gastric juice be put out of action, and, on the other hand, that hyperacidity of the gastric juice increases the extent of the ulceration, since hydrochloric acid acts as a protoplasmic poison. A further point of importance is that an ulcer produced in the digesting stomach is very much more extensive than an ulcer produced by similar means in the fasting stomach.

However the ulcer be produced, and whether in man or in the lower animals, the same principles must obtain, since the laws regulating the digestive processes in all animals are the same. It seems that if we wish to have the smallest amount of damage done, we must keep the stomach in the resting condition, and the acidity as low as possible. Unfortunately, however, we have no clinical means at present of determining whether an acute ulcer in the human being is being produced or is in the condition of healing at the moment when it is brought before us. However, we do know that an acute ulcer is rapidly produced in from twenty-four to seventy-two hours with the gastric juice in its normal condition and the diet normal, so that probably when the case comes under the notice of the physician the ulcer is already fully formed. This probability is strengthened by the results of *post-mortem*

examinations. We further know that the natural tendency of an acute gastric ulcer in both man and the lower animals is to commence healing at once, and for the healing to be complete in a few weeks. This fact is well known experimentally, and is certainly so in the human being, because scars similar in all particulars to those found in experimental animals may be seen in patients who have had short attacks of illness similar to those of gastric ulcer.

Cases are also recorded of injuries inflicted upon the stomach in man which were found to have healed rapidly by *post-mortem* examination. It is also a very common experience, when death occurs from haemorrhage in acute ulcer, to find it advanced in healing, although the illness has been of very short duration. We have seen that occasionally acute ulcers may be delayed in their healing, and that sometimes they may extend, so that it is more important, from the point of view of the treatment of a case, to find out what conditions promote or hinder the healing of acute gastric ulcer than what is the actual initial lesion provoking its formation. It is here that experiments upon animals have been of great assistance in affording indications for treatment. It is merely necessary to state here that various experimenters have been credited with proving that hyperacidity of the gastric juice delays the healing of an acute ulcer. In my opinion many of these experiments are of no value, because a definite ulcer was not produced in the first instance, the solutions employed were in some cases too strong, and an insufficient number of experiments were done. My own experiments have shown that so long as the motor power of the stomach is intact a hyperacidity of such a degree as is likely to be found in pathological conditions will not delay the healing of an acute ulcer, and I am not alone in maintaining this position, because more recent experimenters have confirmed the point.

When the ulcer is being formed, and the gastric juice is acting destructively, hyperacidity will increase this destructive tendency, but when healing has commenced hyperacidity has no more influence in delaying this than has the normal gastric juice. I have also found that diminished acidity of the stomach contents or moderate infection of the food are likewise without influence. The question is a different one when the motor power of the stomach is disturbed, because when retention of food occurs the healing is definitely delayed for a period of at least twice the normal time. This is due to prolonged contact of the partially-digested food with the connective-tissue base of the ulcer, in which necrosis and excessive formation of fibrous tissue are produced, so that the epithelium grows over the base with more difficulty than normal. This being the case, one would expect that an ulcer would not heal so well if the animal were fed on solid food as if it were fed on milk. This is undoubtedly the case, but the effect is seen only in the early stages of healing. When an ulcer is healing, the granulation tissue of the base first becomes covered with a layer of flattened epithelium, consisting of a single layer of cells, and later on this layer thickens and glands develop. Until a continuous layer of cells has formed, the connective tissue of the base is exposed to the action of the digestive fluids, and healing may be delayed, but when once the base is covered up, even with a single layer of cells, the remaining stages will go on normally. Meat is retained longer in the stomach than milk, and produces a larger secretion of gastric juice. On a milk diet I have found that the base of the ulcer is covered with epithelium much quicker than on a meat diet. But I have been surprised to find that diet does not make a greater difference than it does, because even on a meat diet, it is only a question of a little delay in the earlier stages. However, there is no doubt that the most favourable diet in the early stages is a fluid one which is easily digested and not retained long in the stomach. The most important principles to be observed are to allow the stomach to empty itself as quickly as possible, and to give a food which produces only a moderate flow of gastric juice. My experiments on animals have convinced me that rectal feeding for any condition except gastric haemorrhage is to be condemned, and that the milk and egg diet of Lenhartz has much to commend it. In fact, so long as the diet is fluid to begin with for a week or ten days, and at first given in small quantities at frequent

intervals, and so long as solid food is not too suddenly given, I do not think the exact quality of the food matters very much, except that meat extracts should not be used. Lennhartz's method is not altogether founded on correct pathology; his diet is intended to neutralize hyperacidity, which it cannot do, and he puts an icebag on the abdomen to diminish the movements of the stomach, which can only lead to delayed emptying of that organ. Moreover, I do not think that one definite and fixed diet is suitable for every patient, and it is unnecessary.

I do not think that a better diet than peptonized milk can be used for the first three or four days in most cases, followed by ordinary milk, raw eggs and chicken jelly, then breadcrumbs, pounded fish and chicken, milk puddings, boiled eggs, custard and bread-and-butter, and later minced chicken and mutton, potatoes and sieved vegetables, but I do not wish to be dogmatic in laying down definite rules. I think that the patient should be on a more or less full diet at the end of a month. I have found that beef even after this time is badly borne by most patients, and I think it is best not to allow it for the next few months, during which time I warn the patient to live on the simplest food and properly masticate it, to have the teeth properly attended to, and to rest before and after meals. For the relief of pain I use an epigastric ice-bag when haemorrhage is occurring, and in all other cases hot poultices.

I have not found bismuth to be of any particular value, but sometimes order dilute hydrocyanic acid, 5 minims in two teaspoonfuls of water, for vomiting. When the patient is convalescent I think some preparation of iron should be given. It is very improbable that any direct connexion between chlorosis and ulcer of the stomach exists, but still the effect of anaemia upon the healing of acute gastric ulcer is an important point, because haemorrhage leading to anaemia is a common event in ulcer. The fact that an ulcer readily heals although bleeding is going on from the centre of it, seems to show that the importance of anaemia in preventing healing has been over-estimated. Quincke² did two experiments in which lesions were produced in the dog before and after bleeding. In the first experiment the anaemic ulcer took at least thirteen days longer to heal than the normal ulcer. The second experiment proves nothing because the condition of the ulcer is only described up to the twelfth day. Silbermann's³ and Litthauer's⁴ experiments are not quite comparable to the class of case we are dealing with, because they produced haemoglobinemia by injection of chemicals. The evidence that previous loss of blood delays the healing of an ulcer is therefore of no great importance, certainly not sufficiently conclusive to demand the exhibition of iron during the treatment of acute gastric ulcer.

I have so far dealt with the best means of promoting the normal healing of acute gastric ulcer.

I have already mentioned that in man acute ulcer may be delayed in its healing, and also that an acute ulcer may gradually increase in extent. Unfortunately we have no clinical means of diagnosing such conditions at present except that the history is longer than that of an acute ulcer, and haematemesis may occur late in the disease. I regard such conditions as intermediate between acute and chronic ulcer, and there is no doubt that one factor in the causation is retention of food, so that these cases should be treated as I have already described for acute ulcer, the time and the graduation of the treatment being somewhat extended.

Treatment of Chronic Gastric Ulcer.

No experimenter has ever yet succeeded in producing a chronic gastric ulcer in an animal, so that we know practically nothing about its mode of extension, or the conditions under which it heals. I think that the healing of a chronic ulcer is perhaps less common than is usually supposed, because it is probable that, judging from the extensive scarring which may follow an acute ulcer in animals, many scars which have hitherto been considered to result from the healing of chronic ulcers have really been those of acute ulcers more or less delayed in their healing. We certainly know that, as a rule, the symptoms of a chronic ulcer rapidly disappear with rest and appropriate diet, but how many of these ulcers heal it is impossible to say. Probably not many, judging from *post-mortem* records and the previous history, which

usually tells of several previous attacks of a similar nature.

In the treatment, all we can do is to be guided by the principles we have observed in the treatment of acute ulcer. We cannot, however, expect a thickened chronic ulcer to heal in three or four weeks as an acute ulcer does. It must first be got into such a condition that it will stop spreading, and that healing may commence. After this the actual healing must be slower than in the acute form of the disease, so that although the same principles must be adopted, the treatment must extend over a considerably longer period. I was able to show experimentally that in the condition of pyloric stenosis an existing ulcer often took on a spreading character, and rapid ulceration occurred in the surrounding mucous membrane, and I have lately seen two clinical cases in which a chronic ulcer rapidly spread by acute ulceration of the adjoining mucous membrane in acute pyloric obstruction; sometimes one may see evidences of the same thing in closely examining ordinary chronic ulcers of the stomach. The chief symptom of these cases was coffee-ground vomiting, which apparently denoted acute extension of the ulcer. I think it must be taken for granted that recurrences of haemorrhage in a chronic ulcer indicate extension of the ulceration either laterally or in the depth of the ulcer, and there can be no doubt that delayed emptying of the stomach is one cause of such extension.

This is supported by the fact of cessation of haemorrhage from chronic ulcer after gastro-enterostomy, which by allowing of the rapid emptying of the stomach probably stops the extension of the disease. To quote a series of such operations with known after-results: out of 21 cases of simple gastro-jejunostomy for recurrent bleeding in chronic ulcer by Moynihan,⁵ 2 deaths occurred and the remaining 19 patients were free from recurrence of haemorrhage. A few of these cases were duodenal ulcers, how many is not stated, but the majority were chronic gastric ulcers. Both the cases I have quoted above were operated upon for perforation, and in both cases acute pyloric stenosis was produced, with the result that acute extension of the ulcer occurred. This is a very strong argument in favour of performing gastro-enterostomy in addition to stitching up the perforated ulcer, as advocated by Paterson⁶ and other surgeons, although the advisability of this must, of course, be left to the surgeon, who should decide at each individual operation, according to the conditions found. It is therefore of great importance, in the treatment of chronic gastric ulcer as in that of the acute disease, to take care that no undue delay occurs in the emptying of the stomach. As in acute gastric ulcer I think that there is only one condition which necessitates the stomach being kept empty and in which rectal feeding should be temporarily resorted to, and that is haemorrhage. The treatment of haemorrhage from a chronic ulcer I conduct on exactly the same lines as I have described for the acute ulcer.

It is perhaps more necessary to give an alkaline fluid by the mouth in the chronic disease, as a large number of cases have hyperacidity, which increases the destructive action of the gastric juice when an ulcer is extending, as it is in recurrent haemorrhage.

In the treatment of a case in which haemorrhage has ceased or in which no haemorrhage has occurred, we must remember that we have no certain means of telling whether the ulcer is extending, is stationary, or in the condition of healing, so that we must be guided by the two principles that delayed emptying of the stomach increases the tendency to acute extension of the ulcer and delays the healing, and that hyperacidity increases the tendency to ulceration.

Believing, as I do, that the propagation of chronic gastric ulcer is chiefly dependent upon local conditions of the stomach rather than upon the condition of the blood of the patient, I administer the same diet as in the acute condition, but increase it more slowly and extend the treatment over a longer period, thereby relieving the stomach rather than placing the condition of nutrition of the patient in the first place. It is, of course, impossible for a chronic ulcer to heal in a month, as the acute variety is hardly healed before this time, so that I think the treatment should extend over a period of six weeks, during which the patient is confined to bed, and a further

six weeks during which he is allowed to get up. After this he is to eat a light diet for several months, instructions being, of course, given with regard to the care of the teeth, mastication, regular action of the bowels, and exercise.

With regard to the *quality* of the diet, I think that of Lenhartz leaves nothing to be desired. I, however, strongly object to the principle of feeding a bleeding patient, and I do not think solid food should be allowed till the beginning of the third week, milk, eggs, and jellies being the diet for the first fortnight.

During the second fortnight the patient should gradually get on to pounded fish, pounded chicken, lightly boiled eggs, thin bread-and-butter, and custard.

During the third fortnight, minced chicken and mutton, potatoes and sieved vegetables, and milk puddings.

During the next six weeks he would gradually be put on an ordinary light diet, at which he would remain for the next few months.

I give this only as a broad outline and leave the exact details to be filled in in each individual case by the medical attendant according to his ingenuity.

I think iron ought not to be given as a rule till after the first six weeks, and I do not think that bismuth is of any use. For pain I think hot poultices are sufficient, except the patient is bleeding, and then an icebag should be applied. Vomiting is treated by modifying the diet and by hydrocyanic acid in small amounts of water. The Carlsbad water of von Leube⁷ is certainly useful as an aperient but in no other way. Neither do I think that the constant application of poultices which he so elaborately describes is of any value except occasionally to relieve pain. In addition he does not keep the patient long enough in bed. The gelatine treatment of Senator⁸ does not give any better results in any way than other methods, and it has certainly not become popular. We know of no specific treatment for gastric ulcer, so that any special treatment can be one in name only. As a fact each of the three special methods gives practically the same results with regard to mortality and immediate results. Statistics are constantly published by many observers and differ more or less as would naturally be expected. Von Leube's mortality is variously given as from 0.3 to 4 per cent., Senator's about 4 per cent., and that of Lenhartz from 2 to 3 per cent. Von Leube states that he completely cured 566 patients out of 627, and of these 475 were cured under five weeks. In one group of statistics of patients treated according to Senator 28 out of 50 patients were said to be healed in an average of 20.5 days.

Such statistics as these are obviously of little use, but they show that the special factor underlying each treatment does equally little harm to the patient if it does no good. What we want to know is how many patients are cured as shown by after-results, because cessation of symptoms is no indication that the ulcer has healed. Statistics supplying these facts are scanty. Spriggs⁹ gives the after-results of 21 cases treated by the Lenhartz method: 9 had a definite return of the symptoms of ulcer, and 3 indigestion.

These cases probably included acute as well as chronic ulcer, although the author does not separate them; and it is more than likely that return of symptoms in true chronic ulcer would occur in a larger percentage of cases whatever the treatment. In other words, I think it is probable that not half the cases of chronic ulcer heal by medical means; according to Paterson's statistics¹⁰ about 26 per cent. are cured. I think a fair treatment, such as I have described above, and extending over three months, should be given, and if the symptoms return a surgeon should be called in to perform gastro-enterostomy, which, according to what we know of the pathology of the disease, is a rational procedure, and produces its good effects by allowing the stomach to empty itself rapidly.

I am quite aware that symptoms may return after this operation, but the same may be said of gastro-enterostomy for pyloric obstruction, and no one would hesitate in handing such a case over to the surgeon. To sum up, it may be stated that acute gastric ulcer of normal or delayed healing is to be treated by medical means, except those cases which perforate, and perhaps a few in which dangerous haemorrhage occurs; these latter are to be handed over to the surgeon. Probably more than half the cases of true chronic ulcer should be treated surgically,

but a three months' medical treatment is to be tried first, followed by careful dieting, when, if further symptoms occur (pain, vomiting, haematemesis), the ulcer is probably incurable by medical means. All cases of pyloric obstruction, hour-glass stomach, perigastric adhesions, and perforation are to be at once treated surgically.

A final word may be added with regard to prophylactic treatment in patients who have recovered from gastric ulcer.

We know that bacteria and their products are one important cause of acute ulcer, and it is proved that they do so by attacking the stomach through the blood stream, but there is no evidence to show that they are able to do so from the cavity of the stomach in the ordinary condition of that organ. It is, therefore, important to remove all possible sources of infection, such as pyorrhoea alveolaris, chronic appendicitis, and so on. I need not remind you that in chronic appendicitis haemorrhage may occur from the stomach. I have stated above that hyperacidity of the gastric juice is an important predisposing cause of ulceration, and my experiments have demonstrated that other acid substances and protoplasmic poisons, in very weak solutions which are innocuous alone, are able to markedly increase the tendency to ulceration of the stomach. Amongst such acids is acetic acid. I have found that acetic acid of one-eighth the strength of vinegar is able to act in this way, and it is a not uncommon practice amongst a certain class of people to consume large quantities of vinegar. Many other substances which are unconsciously taken in with the food may act in a similar manner.

This side of the subject is quite in its infancy, and these remarks must be rather taken as suggestions for future investigations than as a basis on which to found a definite prophylactic treatment. Still, they show the importance of teaching the patient how to diet himself properly, and to avoid food to which preservatives have been added. It goes without saying that to keep the stomach free from disorders of function must be an important point in prophylactic treatment.

In conclusion, it is true that I have told you nothing new in the treatment of gastric ulcer, but I may, nevertheless, have been able to place the principles of treatment which I have advocated upon firmer foundations than they were before, and, if this is so, our time to-day has not been wasted.

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A Clinical Lecture

ON THE

NECESSITY FOR OPERATION IN GASTRO-DUODENAL ULCERATION.

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GENTLEMEN,—In the male ward there happen to be at present three cases of gastro-duodenal ulceration exhibiting three sets of quite different phenomena. I will take the opportunity, therefore, of discussing the question of surgical interference under the conditions which are illustrated by these cases. Before describing the histories of the patients, I would draw your attention to the fact that in all three the pathological lesion with which we are faced is that of *chronic* ulceration. The pathology of this condition is at present obscure. We cannot consider it as an accidental circumstance that all three patients are of the male sex, because chronic gastro-duodenal ulceration is more common in men than women in the proportion of almost 3 to 1. In women the lesion most commonly met with in the stomach is the so-called acute ulcer, of small size, depressed floor, and steep non-indurated edges. This