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.

BY

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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

ulcer is frequently multiple, and is much more commonly situated in the cardiac and middle zones of the stomach than in the pyloric zone. The chronic ulcer is usually an inch or more in diameter (at any rate when seen by surgeons), with an irregular margin, which shows definite induration. Further, the chronic ulcer is nearly always solitary, and in three out of every four cases is found in the pyloric zone or the duodenum. These differences in the pathology are sufficiently marked to suggest that the chronic ulcer has an etiology different from that of the acute round ulcer. But whether the distinction between the two is really fundamental is a question which awaits further evidence. Ignorant as we are of the etiology of these conditions, we are unable to lay down any laws of prophylaxis. During certain stages of the process there are certain measures, which are commonly called medical as distinct from surgical, which no doubt favour its healing and cicatrization. At the same time there occur accidents and complications which more or less urgently require surgical aid. As to the necessity for operation in some of these accidents and complications, there is complete agreement throughout the medical world, but there is a considerable area of debated ground in regard to others.

My first case belongs to the category of uncontroversial problems. The patient is a man aged 52, who while passing through Liverpool was suddenly taken with acute illness. On being brought into the hospital a diagnosis of perforation of duodenal ulcer was at once made. His home is twenty miles from a hospital; he was on his way to cross the Atlantic to Canada, so that you see he selected a time most favourable to his chances of recovery for perforating! He is an example of the class of case in which the first definite sign of ulceration is perforation, for except for a vague discomfort some three hours after food a few weeks before admission he can tell us of no previous gastric or duodenal symptoms. The diagnosis of perforation depended upon the presence of two physical signs. In the first place, he exhibited extreme abdominal rigidity, most marked on the right side. In the second place, the liver dullness was absent. He had not vomited. He was submitted at once to operation, from which, as you see, he has made a good recovery.

In connexion with this subject of perforation there are several points which I desire to emphasize. The first is the extraordinarily good general condition which many of these patients show when first seen. We may have a history of sudden excruciating pain, but not infrequently it is difficult to believe that anything serious has happened when we medical men are first brought face to face with the patient. This is, perhaps, particularly true of the strong and apparently robust men who form a considerable proportion of those who suffer this accident. Of the various physical signs which go to establish a diagnosis of perforation, you will do well to place the greatest reliance on the absence of liver dullness. Percussing the thorax from above downwards, you find that although the note changes you are unable to demonstrate the loss of resonance which you expect to meet with when passing from lung to liver. One occasionally meets with cases in which this is the one and only physical sign of perforation which can be demonstrated, though it is perfectly true that very rarely is marked abdominal rigidity absent. The details of operation in such cases need not take up our time, but two points are worth mentioning. In the first place, the wound through which the ruptured ulcer is reached may in almost all cases be sewn up as one sews up an ordinary wound of the abdominal parietes; in the second place, it is never safe to omit drainage of the pelvis through a hypogastric wound. Those who have tried the omission of this drainage in cases where they believed that effusion of stomach contents was restricted to the immediate neighbourhood of the perforation will probably have found reason to regret the omission, as I have done myself. After operation this patient was treated, as we treat all such patients now, with continuous rectal saline injections in the sitting position.

Our second patient illustrates another acute accident, but one in which the indications for operation are not so definite. He is a man aged 34, and six years ago was attacked with severe pains in the upper part of the abdomen, associated with vomiting. Ever since then he has had "indigestion"—that is, pain coming on from half

an hour to an hour after taking food, sometimes lasting for several hours and then not infrequently ending in vomiting. Three weeks ago he had copious haematemesis, and since then he has had two more attacks of the same. You see at the present moment he is extremely pallid and looks emaciated. It is now six days since his last attack of haemorrhage from the mouth, and his stools still contain blood in small quantity. His pulse is small and of low tension, 96 per minute; his red cells are reduced to 1,500,000.

You will observe that so far he has had no surgical treatment, and the lesson from that is that very rarely indeed is it either necessary or wise to operate with the idea of arresting haemorrhage from ulceration by some surgical method. With proper measures, the great majority of cases of haematemesis may be trusted to recover from their attack of haemorrhage. The operation, if it is to be done at all, should be postponed until the patient has recovered from the haemorrhage. This is the course we propose to pursue in the case of this patient; so far we have aimed at producing local and general rest; when, however, he has recovered from his attack, we shall advise him to submit himself to an operation. What that operation will be exactly, we are not in a position to state with absolute certainty; we believe the ulcer to be pyloric in position; he is a comparatively young man, and therefore we do not anticipate that it is cancerous, and under these circumstances a choice will be made at the time of the operation between excision of the ulcer and gastro-jejunostomy. In pyloric ulcers either of these procedures may be trusted to give good results, but we prefer to do excision if excision proves easy and does not involve encroaching on some neighbouring organ such as the pancreas. If we are right that the ulcer is pyloric, experience goes to show that gastro-jejunostomy, though less radical, is of very great assistance in bringing about the healing of the lesion. I have already said that patients do not often die directly from loss of blood from ulceration; it is none the less an extremely serious complication, and when, as in this case, we believe it to be due to the erosion of a chronic ulcer, there can be little question that operation is the wisest course to pursue. You are aware that haemorrhage into the stomach occurs from a variety of causes, and that patients have occasionally been submitted to operation for haemorrhage which was not suitable for surgical remedy. This has, perhaps, most frequently been in cases of gastric haemorrhages of young women. I shall not discuss this question at length now, but content myself with simply saying that where there is definite evidence that the cause of haemorrhage is the erosion of an ulcer of long standing there can be no reasonable controversy as to the advisability of surgical measures. If gastro-enterostomy is performed it is necessary to remember that it is only a measure which *aids* healing. Disappointment sometimes arises from the idea that because the patient "has had an operation" he may choose his own diet and neglect medical measures forthwith. Overloading the stomach and hyperacidity are two things which sometimes spoil the effect operation would otherwise have, and a third desideratum in regard to which he must always be instructed is proper mastication. On the cleanliness of the mouth and the thorough use of the teeth the result of the operation largely depends. To sum up the lesson of this case: serious haemorrhage in chronic gastro-duodenal ulceration requires surgical remedy, not at the time of haemorrhage but after an interval of about three weeks. An "interval" operation is required to save the patient from the recurrence of this very serious complication.

The third patient is a labourer aged 49, whose chief complaint was epigastric pain for six months, coming on more intensely about an hour after food, but present off and on for the whole day. He stated also he had lost weight considerably, but we do not know exactly how much. He had medical treatment during the whole of this time, and found most relief from restricting his diet to easily-digested foods. Constipation was another troublesome symptom; he did not vomit. On palpation of the abdomen there was slight tenderness in the epigastrium, no tumour could be felt, but splashing was easily elicited. Furthermore, through his thin abdominal wall peristaltic waves could be seen passing from the left costal border towards the right. We examined the position of the

stomach with the radiosopic screen. After a bismuth meal it could be seen that the greater curvature of the stomach extended as low as the plane of the anterior superior spines when the patient stood up, and active peristaltic movements of the stomach were clearly made out. Test meals showed that free hydrochloric acid was present in the gastric secretion, and also that the stomach contents were retained for many hours beyond the normal. A feature of the case was the absence of sarcinae; apparently, although there was marked stasis of stomach contents, there was little or no abnormal fermentation going on.

This man had therefore marked dilatation and ptosis of the stomach. It was not purely atonic dilatation, for we could see the stomach walls in active and forcible peristalsis. The ptosis was not part of a general abdominal ptosis for no other organ exhibited it. A forcible peristalsis which we can see must always be taken as a definite sign of obstruction, an attempt of the viscus to empty itself against resistance. In this case we judged by what we could see with the screen that the obstruction was at or about the stomach outlet. Considering its presence it is a rather remarkable fact that the man had not suffered from vomiting; it would appear that the stomach had always been able to pass on its contents, although the marked dilatation showed that it had been done under difficulty.

In view of the evidence of obstruction about the pylorus we had no hesitation in recommending an operation. There are types of gastric dilatation in which operation is useless. Purely atonic dilatation of the stomach does occur, although in the past some of the cases so diagnosed were probably a late stage of dilatation resulting from obstruction. In purely atonic dilatation operation is not of value, but the condition is decidedly a rare one. Operation is again of little value when gastric ptosis and dilatation is simply a part of a general ptosis of the abdominal organs. These two conditions should therefore be excluded when the stomach is found dilated before any decision is made to advise operation. In this case on opening the abdomen a cicatricial stenosis of the pylorus was found, and the stomach besides dilatation showed marked hypertrophy of its walls. Posterior gastro-jejunostomy was performed, and care was taken to provide a large opening of $2\frac{1}{2}$ in. The patient vomited twice on the evening of operation, but has not done so since. He was allowed milk diluted with Vichy water on the following day, and now, six days after his operation, he is on a light diet. He has been given bicarbonate of soda, and carbonate of magnesia after each meal in order to prevent any high acidity of the gastric juice, which would interfere with the healing of his gastro-jejunostomy wound. Experiments have shown that such wounds take three or four weeks to heal.

This case belongs, as did the first, to the class of gastric conditions in which the necessity for operation is accepted by all. If you can demonstrate that there is in any portion of the alimentary canal an actual mechanical obstruction to the onward passage of the contents the wisdom in advising operation for the relief of this obstruction is unquestioned. It is of course unnecessary when the ulcer is cicatrized to deal in any direct fashion with it, and we can give complete relief by short-circuiting the food stream. It is very necessary in doing so to be careful of two things—first, to provide a large anastomotic opening; secondly, to avoid the formation of an acute angle at the point of anastomosis. With the latter object a posterior anastomosis is preferred, joining the jejunum to the stomach as close as possible to the commencement of the former.

The indications for operation presented by these three cases by no means exhaust the problems of operation in gastro-duodenal ulceration. You will observe that all three illustrate rather complications of the ulcerative process than simple ulceration itself. In considering the advisability of operation in simple chronic ulceration we are faced with the not infrequent difficulty of diagnosis. Pain, with a constant time relation to the intaking of food, is a symptom sufficient on which to base a definite suspicion of gastro-duodenal ulcer, but it needs to be supported by further evidence before one can say with anything approaching certainty that the ulcer is present. Of the phenomena which lend it support haemorrhage is far and away the most important, and it is therefore worth while taking a great deal of trouble to discover whether

there is bleeding into the stomach or duodenum. In some cases persistent pain in spite of treatment is in itself sufficient justification for an exploratory operation. Such an operation is not speculative, as we know that this pain, with a constant relation to food, is in some cases the one and only symptom of ulcer, and also of other gastric or perigastric conditions remediable by surgical measures.

Most surgeons nowadays prefer to deal with an ulcer directly—that is to say, by resection. The most important argument of all for this proceeding is the frequency with which carcinoma is implanted on ulcer. On this subject a most important communication has recently been made by Dr. W. C. McCarthy of St. Mary's Hospital, Rochester, from which it would appear that this sequence of events is even more common than has hitherto been expected.

I shall say no more on the subject of ulceration apart from its complications, as I have at the moment no illustrative case to show you. I will simply give you some reasons why we should take the opportunity which surgery affords of relieving patients from this serious disease even in the absence of complications. In the first place, gastric ulcer untreated is attended by a mortality which has been estimated at 10 per cent.; in the second place, whether medically treated or not, it is liable to be complicated by accidents seriously endangering life; in the third place, while it is notoriously difficult to obtain definite healing, when this does occur it is liable to be associated with such cicatricial contraction that stenosis follows.

HEPATIC ABSCESS FOLLOWING ACUTE APPENDICITIS.

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THE occurrence of hepatic abscess after acute appendicitis is a very rare complication, and although a considerable number of cases have been collected and recorded by Kelly and others, in most of them the suppuration in the liver had only been discovered at a *post-mortem* examination, and the abscesses were multiple, and therefore were scarcely amenable to surgical treatment.

In the two cases which have occurred in my practice, both were discovered during life and treated by operation.

In the fatal case I believe that no other abscess was present, as I had the opportunity of examining the liver a week after opening the hepatic abscess, and then no external evidence of another liver abscess could be detected. In the successful case the abscess was certainly single. The occurrence of suppuration of the liver is usually a late phenomenon seldom occurring until some weeks after the acute attack. In my two cases the interval between the commencement of the disease and the detection of the abscess was eight weeks and four and a half weeks respectively. It is interesting to note that both cases were apparently convalescent, with a normal temperature for the first fortnight after the operation on the appendix. In one case the abscess followed an operation for an appendix abscess, which was opened about three weeks after the initial attack and was thoroughly localized; while in the second case the operation was performed for a perforated appendix with localized peritonitis within forty-eight hours of the onset of the disease.

There is little doubt that the poison is carried to the liver by means of the portal vein, and that the abscess results from pylophlebitis. The patches of pylophlebitis must be close together and the infection very virulent for a single abscess to form. When the patches of pylophlebitis are separated from each other by any amount of normal liver tissue, we shall have the condition of small multiple abscesses, which is more commonly found in the *post-mortem* room. It is interesting to note that the pus obtained from a liver abscess does not have the characteristic odour of pus from an abscess in connexion with the appendix. With regard to diagnosis, it is practically impossible during life to distinguish between a liver abscess and a subphrenic one. The only point which would suggest abscess of the liver, rather than subphrenic abscess, would be bulging of the right side of the chest with increase in