A Lecture ON THE EARLY DIAGNOSIS OF CANCER OF THE STOMACH.

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MR. PRESIDENT AND GENTLEMEN,—When you did me the honour of inviting me to deliver one of the Hunterian Lectures before this society, the subject of the early diagnosis of carcinoma of the stomach immediately occurred to me as one of the most pressing questions of the day; one, too, which it seemed to me would be especially interesting to the members of this society. It was not until afterwards, when I began to put together the notes that I had formed upon it, that I fully realised that, however interesting this subject might be, it is one of the most difficult that I could have chosen. For by early diagnosis I mean diagnosis during the period in which complete removal of the disease is still possible, while there is still a hope of being able to effect a permanent cure; before the disease has reached the stage in which surgery is as helpless as medicine; and I must ask you therefore to be as lenient as you can in passing judgment on my effort.

SUCCESSFUL OPERATION DEPENDENT ON EARLY DIAGNOSIS.

Before I begin there are certain facts I should like to mention, as they illustrate more clearly than any arguments I can use the extreme importance of this subject. So far as the male sex is concerned, cancer affects the stomach more often than it does any other organ in the body. Nearly 22 per cent. of all the cases of cancer that occur in men begin in the stomach. In women the proportion is not so high owing to the frequency with which the generative organs and the mammary glands are attacked, but the aggregate number is quite as great. At its beginning cancer of the stomach is absolutely and entirely local. No case of cancer of the stomach has ever been cured except by operation. In nine cases out of ten complete removal is perfectly possible if the attempt is made early enough. If the disease begins at the pylorus or along the lesser curvature, as it nearly always does, the whole glandular area that drains it can be removed with it. Secondary deposits in other organs, such as the liver, do not make their appearance until comparatively late. Unless special complications are present (the cause of which is nearly always delay) the operation is not a difficult one, and need not take more than three-quarters of an hour. The mortality, in the hands of those who are accustomed to abdominal surgery, is practically dependent upon the condition of the patient at the time. The shock, contrary to what one would expect, is exceedingly slight; and the after condition of the patient, so far as digestion is concerned, is so satisfactory that I have often wondered whether the stomach is really such an important organ as it is popularly supposed to be. The sole thing that is required is to make the diagnosis soon enough, before the disease has spread so far as to render removal impossible. That must be my excuse for bringing this subject before you to-day.

CLASSIFICATION OF CASES.

Pathologically, cases of cancer of the stomach may be classified in various ways. With this I have nothing to do, as I am only concerned at present with the clinical point of view, and looking from this there are only two groups. In one the growth is latent, manifesting itself only by its general constitutional effect until the disease is far advanced, when it may suddenly demonstrate its presence in a way which cannot be mistaken or overlooked. In the other the growth has been preceded for months, and even for years, by symptoms the significance of which has either not been recognised or else has been ignored. Of these two, the former is much the smaller. It does not comprise 10 per cent., and according to some not even 5 per cent., of the

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total number. Moreover, as the importance of early diagnosis is becoming more and more recognised and fresh methods of investigation are being evolved it is becoming smaller still. But a few such cases do occur. Quite recently I was called in to see a gentleman, about 45 years of age, whose health and vigour had been failing in an unaccountable way for some months past. He had lost weight and strength. His appetite had failed, especially for meat, and his digestion was not good. The amount of free hydrochloric acid had been estimated after a test meal and had been found deficient, but under treatment it had risen again, with corresponding improvement in appetite, until it was all but normal. There had not been any tenderness or pain in the epigastric region. He had not been sick. There was no tumour to be felt nor any enlarged glands. The fæces, which might have given some evidence, had not been investigated. Then, quite suddenly, there was a profuse attack of hæmatemesis with melæna, from which the patient, though he lived some little time, never really recovered. From the first there had been a strong suspicion of malignant disease. The contents of the stomach had been examined on more than one occasion to see if any clue could be found. But until the hæmatemesis occurred a diagnosis such as would justify an abdominal exploration was not possible, and then it was too late. The growth in these cases is usually situated on a part of the wall of the stomach that is far removed from either orifice, so that it does not interfere with the mechanics of digestion. It springs from the mucous surface, which has no sensory nerves in the ordinary sense of the term, so that for a long time, until, indeed, it involves the serous coat, it does not cause pain or tenderness. If it lies on the lesser curvature it may remain concealed beneath the liver until it has attained a comparatively large size. And though the appetite and the digestive power of the stomach may be impaired by the gastritis that accompanies such a new growth, there is nothing to distinguish this special form of gastritis from that which occurs from other causes. In other words, it is not possible to make a diagnosis in such a case during this stage of the disease, simply because there are no symptoms to act as guides. There may be a strong suspicion of malignant disease, perhaps even of malignant disease in some abdominal organ, and especially in the stomach, but unless something more definite can be found operation in such a case at such a stage, with nothing further to act as a guide, can only be called a roving commission, not an exploration, and condemned. Fortunately, as I have said already, such cases are not common, and it is to be hoped that with new and improved methods of investigation they will become less common still.

The other group of cases, those in which the growth has been preceded for months and even for years by symptoms directly referable to the stomach, is far more numerous. For many years past I have made a point of carefully inquiring into the early history of every case of carcinoma of the stomach that has come under my notice, and almost without exception there has been a definite account of characteristic gastric irritation at some period or other. In upwards of 60 per cent. the patients have already been told at one time or another that they were the subjects of gastric ulcer, and in quite half of the rest the symptoms have been of such a character and have persisted or come back again time after time in such a way that there was certainly something far more serious than a mere functional disorder. I have already mentioned one instance in which there was no history of pain, tenderness, vomiting, or severe dyspepsia until the disease was far advanced. The growth seemed to have originated in an uninjured and a healthy stomach, and I have met with a few more with a similar lack of symptoms, but I cannot be too emphatic in recording my conviction that such cases are the exception, that nearly all cases of cancer of the stomach are preceded by definite evidence of gastric irritation, and more than half by the characteristic symptoms of chronic gastric ulcer.

RELATION OF CANCER OF THE STOMACH TO ULCER.

On a *priori* grounds this is all that could have been expected. So far from there being any improbability in such a suggestion, the improbability is all the other way. Cancer may conceivably originate in an organ that is healthy so far as we can tell; but it is infinitely more likely to originate

in one that has been injured, and in the part that has been injured; and the more frequent the injury the more likely it is to follow. In every other organ of the body chronic ulceration is one of the strongest predisposing causes of cancer that we know. It would be the most extraordinary exception if it were not so here. Evidence pointing in this direction has been accumulating quietly for a long time past. At first it was merely a pious expression of opinion that such might conceivably be the case. Then a few instances were recorded in which this transformation had certainly taken place. Soon the number increased, and when general attention was called to it the proportion of cases in which this sequence of events may be considered proved rose in the most extraordinary manner. A few years ago the number in which it was supposed to have occurred was estimated by Fenwick at only 4 per cent. At Kiel, during the period from 1872 to 1891, it was no higher than 14. In the following nine years it rose to 26. Later Mayo, out of 180 cases, estimated that as many as 54 per cent. originated in this way. According to Moynihan it is true of no less than 72 per cent., while Sspashko, as quoted by Jedlicka, maintains that upwards of 90 out of every 100 cases of carcinoma of the stomach are preceded by something in the nature of an ulcer. Nor does this rest merely upon the results of clinical investigation, which might be more or less open to discussion. It has been proved by the study of the pathology of the living, a method of inquiry which has only been rendered possible by the enormous strides that abdominal surgery has made within the last few years. So long as carcinoma of the stomach was only seen in the post-mortem room it was impossible to say why or from what it had arisen. By the time the disease had proved fatal, all trace of any pre-existing ulcer had long since been destroyed, and there was nothing but the curious coincidence of locality shown by ulcers and carcinoma alike to suggest that the one could be in any way a precedent condition in the development of the other. The extraordinary change of opinion with regard to the proportion of cases that originate in this way is coincident with, and due to, the advance which has been made of late years in gastric surgery, which has enabled the beginnings of disease to be seen and not merely those stages which are no longer compatible with life. The conclusions of post-mortem pathology must be revised in the light of what has been ascertained and proved during life, and there can be no doubt which of the two is the more likely to be correct.

EARLY SYMPTOMS.

It is no longer, then, a matter for discussion: it must be taken as proved that malignant disease of the stomach in a very large proportion of instances starts either from some ulcer that has been allowed to persist until it has become chronic, or from some cicatrix that has been injured and irritated for years. The question is how and by what means we can find out the first beginning. To be of any use the diagnosis must be early, definite, and capable of being acted upon at once. There is no difficulty when the supra-clavicular glands are enlarged so that they can be felt, and when the patient is anæmic and has lost a stone or more in weight; but then it is useless. The diagnosis must be made from local signs and symptoms while the disease is still local, or it is of no use making it. Even in such an organ as the tongue, where ulcers and scars can be seen and felt, it is often a matter of the greatest difficulty to decide whether a sore is malignant or not. As may be imagined, in the case of the stomach it is far worse.

The ordinary test, the one that is usually appealed to before a surgeon is allowed to see the patient, is the failure of a plan of treatment that has given a certain degree of relief when tried before. Nothing could well be more unsatisfactory or more injurious than this. The treatment has never cured the patient. At the best it has only relieved the symptoms, and that for a time. Now they have returned again, rather more marked than they were before, in a patient who has grown older, nearer the age when carcinoma is most common, and who is scarcely so well nourished as he used to be. All excellent reasons for not trying the same line of treatment again. It is thoroughly illogical to do so; but men are so curiously optimistic in these cases, being inclined to see only the things they wish to see, and patients, who know nothing whatever about the question, are naturally so disposed to try anything and everything before agreeing to an operation, that the trial is made; the same

line of action followed out again; an immense amount of the most precious time lost, and the diagnosis never made until all chance of curing the patient is long since past and gone. It is a cardinal rule in surgery that diagnosis, whether the case is one of carcinoma of the stomach or not, should precede treatment and not follow it. It is a confession of ignorance to look upon treatment as an aid and help to diagnosis, and no case of cancer of the stomach will ever be cured if the patient has to wait for an operation until after the trial and failure of every line of treatment that is recommended because once, when the disease was of a totally different character, it gave a certain measure of relief.

Whether the disease begins *de novo* in a stomach that is apparently healthy, or whether it starts from the basis of some old ulcer, the first thing to arouse the suspicion of the patient and make him seek advice is a change in the functional activity of the stomach for which he himself can find no explanation. It may show itself in many ways. If the patient has always been strong and healthy, leading an active vigorous life, it may be a sudden loss of appetite, associated perhaps with a special distaste for meat; or an attack of indigestion which does not pass off in a day or two, as it should, and for which we cannot assign a reason. There may not be the acute stabbing pain, running through from front to back, so characteristic of ordinary dyspepsia, but there is a constant feeling of fulness and discomfort after meals, with a nauseous taste in the mouth, and a tendency to sickness. With this there is a great deal of flatulence and very often there are eructations of offensive gases. The first thing noticed, in short, is an attack of gastritis or of gastric irritation, such as is not uncommon in many people, and which would not deserve such attention if it were not for one disquieting feature. It occurs quite suddenly, in a person about middle age, who has never been troubled with attacks of indigestion before without any obvious reason to account for it, and it does not get well as it should. It is this, as a rule, which impels a patient to seek advice; and given this history and these symptoms there should be as little delay as possible in making a thorough examination without waiting for loss of flesh or other symptoms to set in.

The same thing is true of that much more numerous class of patients whose history renders it practically certain that they have suffered at one time or another from ulcer of the stomach. There is the same evidence of gastric irritation, but, as a rule, it does not attract attention even so soon. They are so accustomed to attacks of a somewhat similar character that the additional distress caused by the irritation that accompanies a new growth is scarcely noticed by them. The symptoms are much the same as those from which they have suffered so often before. It is not until the attack has lasted some little time that it begins to dawn upon them that it is more severe and more persistent than usual and that it would be as well to seek advice about it. Indigestion is so common that the earliest stages of carcinoma are often allowed to pass by before the medical attendant is given the chance of making a diagnosis. In any such case where there is a definite history of past attacks, if a thorough examination has not been made already because of the presence of a chronic ulcer it should be now without further delay, because of the possibility that cancer has become grafted on to it. *Every case of chronic ulcer of the stomach is a potential case of carcinoma*; and I can only express the hope that before long every such case that has resisted one thorough course of treatment properly carried out, and still gives rise to the well-known train of symptoms, will be promptly handed over to the surgeon for complete investigation, if necessary by operation. I have not the slightest doubt that this would often prevent the later development of cancer.

Of all the symptoms that are present in these cases, perhaps pain is the most prominent, and it is certainly the one that most often makes the patient seek for further advice. In chronic ulcer the stomach is more or less at peace when it is empty. The pain may be acute as soon as food enters the stomach, or it may not come on until one or two hours later, and then not infrequently the ingestion of more relieves it for a time; but, as a rule, when the stomach has emptied itself, one way or the other, there is some degree of comfort. As malignant disease develops, this disappears. Persistence of pain always suggests cancer. Severity I have found of no use as a guide, for patients vary so greatly in their estimate, their power of endurance, and their

descriptive ability. The pain of chronic ulcer may be as acute as that of cancer, but one or two have told me that the character of the pain has changed, and that instead of, or sometimes in addition to, the sharp cutting pain to which they have been accustomed there has come a steady burning pain in the epigastrium, varying in intensity at times but never quite disappearing. The locality of the pain may be of great service in indicating that of the cause, but it says nothing with regard to its nature.

The degree of local tenderness gives little or no information. The viscera themselves are not sensitive to ordinary pressure, so that any sudden increase of tenderness can only mean that the irritation around the disease has spread more widely to other structures near, and probably involves the parietal peritoneum. As all ulcers in the stomach, malignant or not, are surrounded by a zone of inflammation, this does not help. It merely means that the disease is spreading.

Nor is the presence or absence of a tumour of any great assistance. Every attempt should be made to ascertain whether there is a tumour by examining the stomach in all positions of the body, and when it is empty and when distended with air, but even a large tumour may remain quite out of reach under the left lobe of the liver. Moreover, it does not follow that a tumour of the stomach, even when it is at the pylorus and of recent detection, is therefore malignant. I have operated in several such cases without removing the tumour, and as the patients have lived for as long as six years after gastro-enterostomy had been performed there can be no question that the growths were of inflammatory origin. One case, however, was of very great significance. For four years the patient did well, put on flesh, and was able to do his work and digest his food. Then he began to fail, and six months later when I saw him again there could be no doubt that malignant disease had broken out. Gastro-enterostomy will not always prevent this.

Interference with the motor functions of the stomach is only of help in the diagnosis of malignant disease when it occurs under certain special conditions. It must be of rapid development. Pyloric obstruction and hour-glass contraction are equally, if they are not actually more, common in chronic ulcer than they are in cancer; but as a rule they last for years, judging by the symptoms, and the patient cannot assign even an approximate date for their appearance. It is not their presence which makes them of importance in connexion with this question, but the rapidity of their onset. Obstruction at the cardiac orifice, which is not so common, and which manifests itself by very different symptoms, must be judged separately. As a matter of fact, it seldom occurs except by extension in cases of epithelioma of the lower end of the œsophagus.

CHEMICAL AND OTHER METHODS OF DIAGNOSIS.

A study of the vomiting, on the other hand, in a doubtful case may help a good deal. The quantity is not of much importance. That is controlled mainly by the degree to which the stomach has become enlarged, and pyloric obstruction is even more common in simple than it is in malignant disease. But the frequency with which vomiting occurs, and the examination of what is brought up often furnish valuable information. In the case of a simple ulcer the frequency depends largely upon the amount of food. What is brought up consists of the food, more or less digested, mixed with the secretion from the stomach. If the quantity is large and has been retained for some time, it has often undergone a good deal of fermentation and may have a peculiarly sour, nauseating odour. If small, it consists of little more than semi-digested food. In cancer, on the other hand, though vomiting may be caused by food at any time, it frequently occurs independently; and the vomit, even when small, is often most offensive, grumous, and mixed with blood. The offensive character is probably associated with the deficiency in hydrochloric acid, in consequence of which there is little or no check to decomposition, and is therefore of secondary importance. But the frequent presence of blood, even in microscopic quantities, is most significant. Careful examination should be made for this in every suspicious case, and if it is found to be present frequently, no matter how small the amount, there should be no further delay.

I attach very great importance to the detection of occult or minute quantities of blood in the vomit or the fæces. The former, of course, is always inspected carefully, but this is

not enough. If there is the least suspicion of the presence of malignant disease, every specimen must be examined chemically. The fæces are even more important. Blood is said to have been present in no less than 107 out of 124 cases. For this special precautions must be taken. The bowels should be well opened, and then for three days the patient must not be allowed to take any meat, or anything that might result in the production of hæmatin. The mouth, too, must be carefully examined, so that there is no chance of bleeding from any of the teeth; and, of course, there must be no instrumental interference with the stomach in any way. Unless there is a trained nurse in attendance the collection is always a matter of difficulty, but it should be insisted upon, and it can usually be managed by giving the patient a wide-mouthed stoppered bottle and directing him to pour some glacial acetic acid over what he has collected. It is the first step in the analysis, and it makes the patient realise the importance of what he is doing. Alone, by itself, without any other evidence, the frequent presence of minute quantities of blood in the vomit or the fæces is enough, not only to justify, but to compel an exploratory operation.

If there is no blood in either vomit or fæces and the other symptoms are merely sufficient to arouse suspicion but not to form a diagnosis an attempt must be made to obtain more exact information by other methods. The first of these is the estimation of the amount of free hydrochloric acid that is present in the gastric juice an hour after some simple test meal has been taken. This, though it is not so valuable as it was once thought to be, should never be omitted. In many cases of chronic ulcer of the stomach the quantity of free hydrochloric present during digestion is considerably increased. In most cases of cancer it is diminished, and in some it may fall so low as to disappear altogether. When this occurs lactic acid and the Oppolzer-Boas bacillus make their appearance in its stead.

Unfortunately this test, from which a very great deal was expected, is not so much a test for the presence of carcinoma as for the onset of gastritis caused by the carcinoma; and this may set in early or late in the course of the disease or may never set in at all, and may vary very greatly in intensity under the effect of treatment which could have no influence upon the carcinoma itself. Free hydrochloric acid may be present in the gastric juice in normal quantity throughout the whole course of a case of cancer. It may diminish for a time, and then, under appropriate treatment, rise again to the normal, and even beyond it. The diminution, as I showed upward of ten years ago, may occur in the most characteristic way when the cancer is situated in some other organ, and the stomach is not involved at all; and though in some instances the diminution occurs fairly early in the course of the disease, and therefore when the test is positive is of considerable value in diagnosis, a negative result is worth nothing and should never be taken into account. It is an unfortunate thing that patients, who seem to find a difficulty in realising the importance of this test, not infrequently take strong objection to it, mainly on sentimental grounds. As, however, it is very commonly necessary to administer an anæsthetic in a doubtful case of this character for other reasons, advantage can be taken of the opportunity to obtain at least one specimen for analysis.

Examination of the thorax and abdomen with the X rays, after the patient has been given two or three ounces of carbonate of bismuth mixed with bread and milk or porridge to swallow, is another method that should always be tried in a doubtful case. But this again, like some of the others I have mentioned, is of more use in diagnosing distortion or dilatation of the stomach due to the contraction of some old scar than in distinguishing simple from malignant ulceration. It succeeds best, of course, with a thin patient. Until recently the whole examination had to be carried out with the screen, which requires a very considerable amount of practice before any useful result can be obtained. The shadow thrown by a bolus of food mixed with carbonate of bismuth passing fairly rapidly over the screen is rarely so sharply defined or so distinct as it is represented in illustrations. Recently, however, I have had some excellent results with the instantaneous method of photography. If two or three plates are taken in rapid succession they can be studied quietly and sometimes a great deal of valuable information obtained. The position of the greater curvature (the patient, of course, is standing up) and of the pylorus can be ascertained with a fair degree of certainty, and, what is much more important,

any slight deviation from the normal outline can usually be seen. I have on several occasions diagnosed the existence of an hour-glass contraction of the stomach in this way and verified it by subsequent operation, but I have never yet seen the surface of a malignant ulcer coated over with a layer of the bismuth, and so presenting a blackened patch, after all the rest of the bismuth had passed on, as has been described by some observers.

Many attempts have been made by examining the blood in various ways to find some criterion which might indicate the outbreak of cancer. Could such be found, it would solve many difficulties, not only in connexion with malignant disease of the stomach, but with that of other organs also. But to be of any real value in the early diagnosis of cancer this blood test must be certain, easy of application, and, what is far more important, must be such that it can be relied upon to indicate the presence of cancer at its earliest appearance, while it is still local. It is of little or no use if it merely indicates the presence of a malignant growth after it has infected the general system. It must be capable of indicating the first beginning, and it has yet to be proved that such a thing is possible. Cancer, at the first, is a purely local affection, and it is during this stage that it must be diagnosed and treated if the patient is to be cured.

Most of these methods—such, for example, as the failure in digestion leucocytosis and the increased pseudopodial energy of leucocytes in the presence of cancer serum—do not fulfil these conditions. Deaver speaks well of Kelling's hæmolytic test, using hen's blood, but I have had no experience of it. According to him, no less than 64 per cent. of cancer cases gave a positive reaction, and in six out of the nine that failed the patient was already in a state of advanced cachexia. The degree of hæmolysis seems to diminish as debility increases, so that this may be of some use as an early test.

The importance of the antitryptic index of the serum rests on different grounds, as its value is chiefly negative. It has been shown by Mr. E. C. Hort, who made use of chemical methods, and by Mr. H. W. Bayly, who, following Dr. F. L. Golla, estimated the index from the difference in the electric conductivity of the mixtures he employed, that the power of inhibiting tryptic digestion is much higher in the serum of patients who are the subject of cancer than in that of those who are healthy, and that this is nearly invariable. It occurs in 96 per cent. These results, too, agree very closely with those of observers who have employed other methods. This, therefore, must be admitted; but as the index is raised quite as much in many other complaints, in all infectious diseases for example, it cannot be taken as proof of the presence of cancer. The value of this test rests, as Mr. Hort points out, not in the rise of the index in cases of cancer, but in the absence of rise in cases that are not cancer. Given a case of ulcer of the stomach, in which the diagnosis, whether it is simple or malignant, is still in the balance, the absence of a rise in the antitryptic index of the serum is evidence in favour of the former. But, as with most other blood tests, it is not yet certain whether this one gives a result which can be relied upon in the early stages of the disease, when the diagnosis is most difficult and of most value, while the growth is still localised. If it only succeeds when the general system is already affected, it would rather negative operation than encourage it.

THE VALUE OF THE GASTROSCOPE.

The recent improvements in the construction of the gastro-scope that have been effected by Dr. H. S. Souttar and Dr. Theodore Thompson render it exceedingly likely that in the use of this instrument we have at last the means of making an early and a sufficiently accurate diagnosis. As it sometimes is impossible to distinguish a simple from a malignant ulcer, except by a long and careful microscopical examination, it is not to be expected that inspection through a gastroscope will invariably give a definite answer. There will always be cases in which there is a certain amount of doubt. I am convinced, however, that there will not be many in which inspection through a gastroscope, aided and supplemented by the other methods of clinical investigation I have already detailed, does not give a sufficiently definite answer to render the line of treatment that is advisable absolutely beyond question. The instrument itself need not be described here. For the details of its gradual evolution from the form of gastroscope originally

made by Leiter from the designs of Mikulicz, I must refer you to the papers published by Dr. Souttar and Dr. Thompson. It is sufficient for my purpose to-day to state that by its use the whole of the mucous membrane lining the interior of the stomach, except a small portion immediately around the cardiac orifice, can be inspected and examined deliberately without any further risk than that entailed by passing an œsophageal bougie while the patient is under an anæsthetic. The stomach should be emptied first and washed out by means of an ordinary tube. (If a simple test meal has been given before, advantage may be taken of this to obtain a specimen of the gastric secretion for the purpose of analysis.) The patient lies upon a flat table with a small cushion beneath the shoulders. The mouth is kept open with a gag, a full-sized bougie is passed first as a precaution, and as this is withdrawn the end of the instrument is carefully guided by the finger into the pharynx. Once past the cricoid cartilage, where there is always a little difficulty, the instrument slips down almost of its own weight until the cardia is reached. Here it usually stops again for an instant, and then slips onward into the stomach. The pump is then attached, the stomach inflated, the light switched on, and the nose of the instrument rotated and deflected until the whole of the interior has been systematically examined. The colour of the mucous membrane, pale or bright according to the amount of blood that is circulating in the stomach, the difference in the pattern of the cardiac and pyloric portions, the arrangement of the folds into which the lining membrane is thrown, and the regularity with which they converge towards the pylorus are apparent at once. Ulcers, erosions, and petechial hæmorrhages stand out distinctly. The least break in the even surface, the slightest change in the shape or direction of one of the folds, or the least thickening of the mucous membrane can be seen at once. At the same time the opportunity may be taken of ascertaining the shape and size of the stomach by percussion and by transillumination—darkening the room so that the illuminated area can be seen through the abdominal wall. Up to the present the use of the gastroscope has been so restricted that it is not possible to say what important consequences may not follow from it. Already it has been of the greatest service in confirming the diagnosis of cancer in cases in which there were only grounds for suspicion. Judging from the way in which the cystoscope has revolutionised the surgery of the bladder there is every reason to hope that when the gastroscope becomes better known and used as a matter of routine in every suspicious case a great deal of the most precious time of all will be saved, and a constantly increasing proportion of cases of cancer of the stomach will be diagnosed at a stage when there is still a prospect of the whole of the disease being removed.

CONCLUDING REMARKS.

When all is said and done, it still remains that the diagnosis of cancer of the stomach, at a sufficiently early date to render complete removal probable if not certain, is a problem that is not yet solved. The difficulty in the first instance is with the patient. When cancer occurs in a man whose digestion has previously been good, and only manifests itself by the vaguest and most general symptoms, no diagnosis can be made. The opportunity is not given. The patient does not think for an instant that there is anything seriously the matter, and dismisses it all from his mind as an attack of indigestion. Even when he does seek advice, it is usually some time before he will submit to a thorough examination under an anæsthetic, and by that time it is often too late.

The chances of early diagnosis ought to be brighter when cancer breaks out in a patient who has for years before been subject to attacks of gastric irritation. The possibility, nay, more, the probability, of its occurrence in such a case is always present before our eyes. The most active predisposing causes of cancer that we know are ceaselessly at work; and the slightest change of any kind, the least difference in any one of the ordinary symptoms, ought at once to suggest that cancer has already broken out, and that there should not be a moment's further delay. But here again the transition is so gradual and imperceptible, and the patient is so much accustomed to attacks of indigestion in all its forms, that the actual beginning of the disease is very seldom noticed. The earlier symptoms do not manifest themselves sufficiently plainly to attract the patient's attention

and no steps are taken to find out, even though the question is one of literally vital importance, until the disease is so far advanced that the patient cannot help being alarmed.

The one great hope lies in the prevention of cancer by the efficient treatment of the condition which so often precedes it and which is undoubtedly a predisposing cause for it. Now that the interior of the stomach can be inspected with safety and certainty no anatomical lesion, whether a definite pathological diagnosis can be made or not, should be allowed to remain as a breeding spot for cancer. It does not matter whether it is an ulcer or a scar that has been left by one. It is sufficient that the symptoms caused by it persist or if they do disappear return again later. The persistence of symptoms of gastric irritation or their recurrence after a thorough course of medical treatment, loyally carried out, means that those measures are useless, that it is no good trying them again under similar conditions, that there is some reason why they are useless, and that an attempt must be made to ascertain what that reason is without further delay. In every such case, without waiting for the suspicion of cancer, a thorough examination of the interior of the stomach should be made with the gastroscope. If there is an ulcer that has become chronic or a scar that is constantly being irritated or any other lesion, it should be dealt with surgically without further delay or trial of measures that have already been proved futile. Every such ulcer or irritated scar in the walls of the stomach is not only a source of present misery to the patient, wrecking his life, and rendering him unfitted for either work or pleasure, but it is the strongest predisposing cause of cancer that we know. The question is a very simple one. The patient must be told that the choice lies between an immediate operation, with a reasonable prospect of a comfortable life afterwards on the one hand, and, on the other, life-long misery with more than the possibility of an outbreak of cancer at the end.

A CASE OF MALIGNANT DISEASE OF THE APPENDIX VERMIFORMIS TREATED WITH EMANATIONS OF RADIUM.

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THE case to be described seems of sufficient interest to merit publication for more than one reason. In the first place, the lesion was a primary growth in the appendix; in the second, the patient survived eight years from the commencement; and in the third, it was, as we believe, the first case to be treated by a solution of the emanations of radium. The use of radium emanations was first suggested by Sir William Ramsay and mentioned by one of us (L. B.) in a lecture at the International Congress of Arts and Sciences in St. Louis in September, 1904.

In the winter of 1900 the patient, a man, at that time aged 59 years, commenced to suffer from a looseness of the bowels with a tenderness over the region of the cæcum and slight rises of temperature. Although he had been abroad in China for many years there was no precedent history of any illness bearing upon his complaint at this time, and, indeed, his life-history was a very good one so far as the record of illness was concerned. The diarrhoea, which at first was supposed to be of simple character, persisted, and in the early beginning of it nothing abnormal in character was felt in the abdomen or per rectum, and the kidneys were found to be healthy. The diarrhoea, which was not severe, persisted, however, and the patient was seen by Dr. S. J. Gee and the late Dr. George Thin. The former found some abnormal dulness on percussion just above the anterior superior iliac spine, but no tumour was discovered at this time. It should be observed that the patient was of stout build. The diagnosis was obscure, but the case did not seem to tally quite with a chronic appendicitis, and it was thought to be one of colitis or faecal ulcer.

Early in 1901 the present reporters saw the case together, and it was then possible to feel on deep pressure inside the anterior superior iliac spine a small elongated tender

swelling. This swelling was suggestive of a chronically inflamed appendix or else of a malignant growth in the appendix; and this latter suggestion was then made by one of us (L. B.). It was decided that operation should be performed, and Sir Frederick Treves, who agreed with the fact of the presence of the swelling, opened the abdomen on a day early in February, 1901. The appendix was removed. It was found to have a considerable enlargement of the distal end, the proximal end attached to the cæcum being healthy. The whole organ was removed, the tumour at the end being shelled out from the iliac fossa to which it was bound down by adhesions; and this bed from which it came was scraped with a sharp spoon. A gauze plug was inserted down to this spot and the abdomen was closed. The patient did not take the anæsthetic very well, but made a good recovery, the gauze being removed on the second day after the operation, and there being no unusual complications afterwards. It was suggested from the macroscopic appearance of the tumour that it was merely an appendix with a bulbous end due to chronic inflammation. The appendix and tumour, however, were sent to Dr. F. W. Andrewes at St. Bartholomew's Hospital for report as to its nature. He reported: "The mucosa shows only chronic inflammation, but infiltrating the whole thickness of the muscular coat on one side I find cavities full of colloid material and lined by a very perfect columnar epithelium. I have no doubt that it is a columnar-celled carcinoma with early colloid change. I cannot imagine anything but malignant disease infiltrating the muscular coat like this. It may very well be attacking the appendix secondarily. There is no connexion in my sections between the new growth and the mucosa."

During the next two years the patient remained well, but occasionally he suffered from pain in the right iliac fossa. This became more persistent in 1904, and in March of that year he was seen by us together. Some thickening was then detected lying deeply in the iliac fossa beneath the scar of the old operation wound. Throughout the summer of 1904 good health was maintained, but in October the tenderness again became more marked; he was, in spite of this, able to go shooting in December. On the 12th of that month commenced a severe illness, there being pain in the right iliac fossa and right flank, with rises of temperature at night, and a tumour easily palpable and situated in the right iliac fossa.

In January, 1905, Mr. C. B. Lockwood met us in consultation, and while it was recognised that a recurrence of the old growth had shown itself, it was also seen that there was some septic inflammation within or about the tumour. By this time the patient was severely ill and the tumour was growing rapidly in size, the temperature being continuously raised.

On Jan. 7th Mr. Lockwood opened the abdomen through the scar of the old wound and examined the growth with a view to ascertain if any relief could be given by its removal or by short-circuiting the bowel. The growth was found to be hard, nodular, and solid, and quite irremovable, and as the patient was very ill and could not stand a prolonged operation the abdomen was simply closed and nothing further was done. The colon, it was noticed, passed over the summit of the tumour and was adherent to it, but was not obstructed by it. Convalescence from the operation proceeded but slowly and was hampered by the presence of congestion of the bases of the lungs and consequent cough, so that some of the superficial stitches in the abdomen gave way. The patient's condition getting slowly worse, it was decided to try the effect of injections of cinnamate of sodium, and these were given at intervals, without any appreciable effect, from Jan. 17th to Feb. 10th. The tumour was continuing to increase in size during all this time, and the temperature was hectic in character; further, the skin over the flank became cedematous and red, and a mass formed on the right thigh just below Poupart's ligament, which mass was also nodular to the touch. One of us (L. B.) at this time suggested that a solution of radium emanation should be given, and this was obtained by the kindness of Sir William Ramsay, who provided us with the quantities we required. One cubic centimetre of water which had absorbed radium emanations for 10 days was injected into the subcutaneous fat on two successive days (Feb. 11th and 12th). On Feb. 15th the last injection of cinnamate of sodium was given. On the 20th the mass in the groin gave way and foetid green pus poured out in very large quantity, as much as four ounces coming away at one dressing.