the rest of the patient's life, but this is only the case because of the disease being so severe that without insulin death would quickly ensue. Exactly the same statement might be made with regard to our food. Once we begin to take food it must be taken for the rest of our lives, otherwise we would perish. The important point is that as far as insulin itself is concerned there is no more need to continue with it permanently once it has been used than is the case with any other therapeutic agent.

In giving insulin it is well to begin with not more than five units twice daily; after a few days this is increased to six units and then to seven units, etc., until the urine becomes free from sugar. When this happens the patient is kept on the particular dose he was having when the glycosuria disappeared. The great importance of going slowly cannot be over-emphasised if safety is to be achieved in all cases.

What happens in the diabetic patient is that during the first few weeks of insulin treatment there is a certain amount of increased tolerance; probably certain of the pancreatic cells which were tired out now revive once again with the result that the patient himself secretes more insulin than he did at the onset of treatment. It may, therefore, happen that a dose of insulin which is too small for the patient at the beginning of treatment may be quite excessive after a few weeks. It is owing to neglect of the fundamental principle of going slowly that accidents happen with insulin. Again, the rather foolish kind of statement sometimes made that "the use of insulin is worse than the disease" is probably dependent on lack of experience of the best method for the administration of insulin. Insulin is by far the greatest boon that has ever been conferred on the suffering diabetic patient, for through its proper use he may, in almost every instance, regain a great measure of health and strength. Though insulin must be given as a hypodermic injection yet the inconvenience resulting from the needle puncture is trifling on the whole, and patients get quite accustomed to it and do not mind the injection. Of course, a preparation which could be taken by mouth would be preferable, but there is, unfortunately, no prospect that insulin can ever be administered in this way.

When insulin is used it is all-important that the diet and insulin dosage should be carefully correlated, but in every case a sufficient diet can be arranged. The above are the chief points to be observed in the treatment of diabetes with insulin in general practice. Space does not allow of the various details of treatment being discussed, but anybody interested in the subject will find full details in my monograph.¹ Finally, I should like to emphasise the statement that when given as here described insulin may be used with safety by any general practitioner without the necessity for a single blood-sugar determination.

CHRONIC LESIONS OF THE STOMACH.

A Special Clinical Demonstration for Members of the Fellowship of Medicine, at Westminster Hospital, on Jan. 27th, 1926,

BY

E. ROCK CARLING, F.R.C.S. ENG.,

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THE first three cases here described I am using as the text of my remarks on the problem of chronic lesions of the stomach. All three patients complained of their stomachs in answer to the first interrogation by the clinical clerk.

The first, a man of 62, has suffered from abdominal pain after food and from vomiting, symptoms which have been present for five months. To be more precise, the pain is in the upper abdomen, occurs from three to three and a half hours after food, and is invariably relieved by vomiting. It is doubtful if hæmatemesis has ever occurred. There have been intervals of freedom from symptoms from time to time. At present he has a very poor appetite, and is taking only milky foods. Loss of weight has been considerable, and of recent date he has suffered from constipation. He is a thin, pallid, ill-looking man. The teeth are all artificial. There is a cicatrix of the abdomen; he says he had an operation for appendicitis three years ago, although the position of the scar hardly suggests this operation. Occasionally one sees peristaltic waves passing from left to right. On palpation the right rectus is found to be rigid, and in this situation there is tenderness preventing any attempt at stimulating peristalsis. It is, nevertheless, possible to distinguish a mass in the right side of the epigastrium. The test meal result is a total acidity of 0.24 per cent. with free hydrochloric acid 0.11. It will be convenient to postpone consideration of the barium meal until the other cases have been dealt with.

The second patient is 21. He also complains of pain after food. His past history is that, without any previous complaint referable to digestion, he underwent an operation for perforation of a pyloric ulcer ten months ago, since when he has never been comfortable. Pain occurs in the left upper abdomen and extends downwards to the hip; it has no relation to meals and it often occurs at night. There is no vomiting, but flatulence is a prominent symptom. The appetite is good. The patient looks healthy, his teeth are good, the tongue is clean but flabby. Beyond some tenderness in the left side of the abdomen nothing is palpable. In his case the test meal shows: total acidity, 0.27 per cent.; free HCl, 0.2 per cent.—i.e., distinctly high. Organic acids are only present as a trace. Again I postpone consideration of the radiograms.

The third patient, a man of 50, complains of pain after food and vomiting. In 1918, he was operated upon elsewhere for duodenal ulcer and gastro-enterostomy was said to have been performed. You will see later that we have some reason to doubt the nature of the operation, and, unfortunately, our inquiries for information have led to no response. The operation had been preceded by five years' symptoms, but after his operation he was well until last October, when he began to suffer from a recurrence of pain and vomiting, the pain coming on at variable periods from half to two hours after food. In his case also flatulence is very troublesome. He has occasional periods of freedom from symptoms. His appetite has lately been poor, but there is no suggestion of distinct distaste for food.

He is very thin, but not really emaciated. On examining the abdomen there is found rigidity, and a palpable mass to the left of the middle line which has a well-defined edge and is mobile on respiration. The test meal has a very low acidity, 0.05 per cent., with total absence of free HCl and with a considerable amount of blood.

Let us now examine the radiograms of the barium meals in these cases. The first patient, it will be recalled, was thin, pallid, with loss of appetite, and severe vomiting, but with intervals of freedom. It is seen that the stomach fills well with the opaque meal but that this does not include the extreme end of the pyloric antrum and there is no duodenal cap. On following the meal at intervals we see that these features persist in all the radiograms; the last one shows that considerable barium remains at the end of 24 hours, and the oblique view which it offers shows a distinct suggestion of a crater. I can go no further than that at this stage. Still, the stomach takes a very long time to empty.

The radiograms of the third patient, the man of fifty with loss of appetite and loss of flesh, who had been operated on for duodenal ulcer, shows in the first place that the cavity of the stomach is reduced to a tube-like structure suggesting that the pylorus must have been excised and that anastomosis with the jejunum had been performed. There is, however, an alternative explanation that the ulcer was in fact neoplastic and that considerable thickening of the stomach wall has taken place. This latter view is held by the radiographer. I myself am inclined to favour the first explanation. The other patient was the young man who had perforated gastric ulcer, who underwent an operation, but as to what was done we have again no information. The radiogram here shows very poor filling of the duodenum. Presumably at the operation, either inevitably or deliberately, narrowing was effected. There is evidence of gastro-enterostomy fairly well to the left side. The pyloric portion fills well, giving the appearance of an hour-glass. The gastro-enterostomy is seen to be efficient and the undue filling of the pyloric portion persists in all the pictures. Distension with gastric contents is observed between the gastro-enterostomy opening and the obliterated much-narrowed duodenum, even five hours after administration of the meal, although the rest of the stomach empties in average time.

GENERAL CONSIDERATIONS.

I will now deal with some generalities and draw upon experience for decision in these three cases. A good deal of what I must say is elementary.

The chronic lesions for consideration do not include hæmorrhage nor perforation. For hæmorrhage we do not operate as a routine, but perform blood transfusion. I am not going to distinguish too closely those ulcers which surgeons are prone to separate with great minuteness in their relation to the pyloric vein. For my purpose all ulcers in

the pyloric region are much the same. In addition to these and duodenal ulcers, are ulcers of the lesser curvature, of the greater curvature, and of the posterior wall. A good deal may depend on these situations as regards the line of treatment, as you will see later on. I confess I know nothing as to the causation of chronic ulcers. When I was a house physician the wards upstairs were never without chlorotic girls who came in for acute gastric ulcer. Now, chlorosis has disappeared and we see only chronic cases. May I, in passing, say this: We found in going over the records that long histories relate to simple rather than malignant ulcers. This has some bearing on the question whether simple ulcers become malignant—a discussion much in the air at present. So far as our evidence affords, we do believe some simple ulcers become malignant.

Now for signs and symptoms.

Pain.—I think the sharpest pains are associated with lesions near to the fundus rather than in the pyloric or pre-pyloric regions. The most severe pains are in ulcers extending into the neighbouring viscera. As regards the time of the onset of pain this undoubtedly depends to some extent on situation. An ulcer close to the oesophageal opening will be associated with pain soon after food, one at the pylorus later; but so many ulcers occur in intermediate areas that only extreme cases can be dogmatically defined in this relation.

Vomiting is a feature of certain cases. It is not, I think, the result of ulcer itself, but of difficulty in emptying which ensues. On the other hand, nausea, retching, and eructations are very common. Difficulty in swallowing is rarely a feature, but occasionally this symptom has led to a mistaken diagnosis of cancer of the oesophagus.

Bleeding, apart from hæmatemesis, is very variable. It is difficult to be sure how little blood in the test meal may be accepted as evidence; of course, a considerable quantity of blood demands attention. I do not consider occult blood in this connexion; it is naturally a troublesome investigation and demands the prolonged continuance of the patient upon a hæmoglobin-free diet.

Loss of flesh is very frequent. It is not necessarily an indication of neoplasm. Of the last 20 cases investigated, two in whom from two to four stone had been lost, were cases of simple ulcer. On the other hand, in some instances of definite neoplasm no weight had been lost.

Tenderness of the abdomen affords no criterion as to the situation of the ulcer. Tenderness, like pain, is probably segmental in distribution.

Distension of the stomach is very common indeed as a result of flatulence, and occasionally, as in the first patient, it is possible to see peristalsis. In some cases vomiting may be very copious when there is great over-distension. One patient with extreme scirrhus of the pylorus had very severe vomiting as the sole symptom of only five weeks duration.

The tongue may be clean, but—and I give this for what it is worth—I think one finds in gastric lesions a large, flabby, indented tongue, contrasting with a clean tongue in duodenal cases. The breath is generally foul.

As regards *appetite*. Some patients tell you that their pain has no relation to food, but on enquiry it will be found

that their comparative comfort depends upon restriction in their diet. An exact enquiry as to the quality and quantity of the food is necessary. Total loss of appetite amounting to a distaste for food has a sinister significance. Neurasthenic or neurotic symptoms are often part and parcel of this condition, and a mistaken diagnosis of nervous dyspepsia is by no means unknown. I take this opportunity of paying a tribute to our physician colleagues who restrain us from operating upon patients whose gastric symptoms depend on organic neural lesions.

Turning from history, we proceed to examination by barium meals, test meals, and other laboratory aids.

With all deference to pathologists and physicians, I would like to say a few words on the question of isolated reports. As you know, it is common to find absence of free HCl and low total acidity in neoplasm. Here is a report of a test meal corresponding to normal limits in a patient with most extensive carcinoma. Here is one with a low total acidity 0.03 per cent., yet with a blood count of 94 per cent. hæmoglobin and six million red blood cells. Here is a third with a very high total acidity in a case of malignancy, the high acidity depending upon a condition of ulcer antecedent to the onset of malignancy. Duodenal ulcer cases generally show high acidity figures, but here is one with a very low total acidity and absence of free acid, a picture which would, of course, do very well for a neoplasm.

Take as a contrast these two gastric ulcer cases; one with a normal test meal, another with a distinctly high count. Yet the ulcer was in exactly the same situation in both. It is, in fact, difficult on test meals alone to base any conclusion. I may say we employ as a routine the single, not the fractional test meal.

As regard blood counts: I have mentioned the remarkably high figures in one malignant case. Take as a contrast this case of simple ulcer, with only 45 per cent. hæmoglobin and four million red cells; one month after the operation the hæmoglobin has risen to 58 per cent.

We will now consider some radiograms of typical gastric ulcers with crater and constriction of the stomach opposite the ulcer; and of duodenal ulcer with deformity of the duodenal cap and only occasionally with the visible crater. The first is a radiogram of the stomach—the leather-bottle type—of the patient with a very high blood count and a test meal typical of malignancy. There is one point in connexion with the treatment of this patient to which I must refer. I performed jejunostomy out of a feeling of despair, since removal was impossible and feeding by any other means was inadmissible. After jejunostomy regurgitation soon occurs, and the fluid irritates the skin so that so far from relieving the patient she suffered more than had death occurred earlier. I doubt if jejunostomy in such cases is ever worth doing.

Let us now return to a consideration of the prospects of the two patients with malignant disease.

Operation for frank cancer of the stomach has an exceedingly bad prognosis. Of the last seven cases investigated in the records not one is alive after eighteen months. Of two cases of commencing carcinoma—i.e., simple ulcer becoming malignant, both are alive and apparently well. If one operates on every case it is probable that some will be seen early enough to permit excision and ensure a lengthy survival period.

GASTRECTOMY IN SEVERE ULCER OF THE STOMACH.

I will now deal with three female patients who have been treated by gastrectomy for severe ulcer of the stomach with good results.

The first patient had a very large deep ulcer on the posterior wall of the stomach extending into the pancreas and adherent to the liver. The radiogram shows that there was very little stomach on the cardiac side, and operation was very difficult as a mechanical proposition, quite apart from the debilitated condition of the patient.

The second patient had a very similar ulcer of the lesser curvature, not so large but penetrating into the pancreas. The radiogram shows the result of the gastrectomy; naturally the meal appears to pass straight into the jejunum.

The third case was very instructive to me. I performed gastro-enterostomy three years ago with very little relief for reasons now quite plain. The radiogram shows that the gastro-enterostomy is functioning well, but that food is passing over the ulcer. Gastro-enterostomy *per se* is useless as treatment for an ulcer on its cardiac side.

The general condition of these three patients is distinctly good, remembering their greatly reduced condition prior to operation. They do very well if they take only small meals, necessarily so considering only about one-fifth of the stomach is left, although this fraction undoubtedly enlarges.

So far I have not referred to alternative diagnoses. The appendix is always with us. Tabes is a trap for the unwary surgeon; gastritis, alcoholic or otherwise, has to be excluded. The whole subject of adhesions is too big to consider at present. But I would like to give you two histories of patients in the ward which show another aspect of the subject.

The first patient was admitted for pain after food, nausea, and vomiting for the past five years. The pain occurring one hour after food was of a gnawing character relieved by bismuth or hot water. The vomit has contained blood. The bowels are regular, there has been no loss of weight. The barium meal shows a normal stomach with, however, an irregular pylorus. Test meal: free acid, 0.11 per cent.; total, 0.19 per cent. But, and this is the interesting part of the report, the radiographer supplied positive as well as negative information. He told us that one or more gall-stones were well seen. We are nowadays in a position to verify the relation of these shadows to the gall-bladder by giving sodium tetra-iodo-phenolphthalein intravenously. This is excreted into the bile and, being opaque to X rays, gives a shadow of the gall-bladder. In this case the shadow of the gall-bladder was absent, a large stone blocking the cystic duct. At operation the stomach was found to be healthy. The history of this patient corresponded very closely to those of undoubted ulcer cases.

Take another case—a woman of 45. In 1902 she was operated upon in King's College Hospital for hæmatemesis, presumably due to gastric ulcer. Since then she has

suffered from heart-burn and pain in the epigastrium. In 1921 appendicectomy was performed with relief from symptoms for six months. A recurrence of epigastric pain, with poor appetite, led to her admission here on the medical side. A barium meal showed the stomach to be low in position but apparently normal. Cholecystography revealed the gall-bladder filling well with bile but with stones embedded.

In instance these cases to show that cholelithiasis may mimic true gastric lesions very closely; but generally test meals and barium meals in the hands of experts lead to differentiation.

We now pass to the consideration of some cases of a totally different character.

This patient had very severe osteo-arthritis of mono-articular type with almost absolute ankylosis of the right hip. Whitman suggested that in a case of this type one should excise the head round the neck, detach the great trochanter with all its muscles, abduct the thigh, tilt the upper end of the femur into the acetabulum, reattach the great trochanter down the shaft and implant something to make a joint. Such a task undertaken in these cases is by no means easy; but this patient had perpetual pain and could walk only with great difficulty. The result, as seen on the fluoroscopic screen, may not be pretty, nor is the gait elegant, but the difference to the man hitherto quite disabled is very considerable.

The other patient who has undergone the same operation comes up with crutches, which is not, perhaps, a recommendation. I think, however, he uses his crutches for moral support and could really dispense with them. He was operated upon seven months ago so that he ought to be walking better if the operation is to be considered successful.

The next case is that of a patient who at the age of eight fell 50 feet or so on to a marble floor and smashed his head, with resulting complete paralysis of the right side. The leg recovered after trephining and clearing the clot which had spread over both hemispheres from the superior longitudinal sinus. For many years the right arm gave trouble, but recovered when he learnt the 'cello at the age of 16. He had a large silver plate moulded to his skull for five years, at the end of which time the silver screws began to erode, the plate loosened, and was removed. A year or two later epileptic fits occurred which were controlled by luminal. More recently the fits became Jacksonian, and Dr. Hildred Carlill advised some further operation to fill the gap and detachment of the superficial parts from the dura. I inserted six grafts from his tibia which have consolidated well. He has since been free from attacks.

Finally, we will consider the case of a girl who had already lost the thumb of her left hand and two fingers of her right hand from Raynaud's disease, and who had come in on account of threatening gangrene of three more fingers. We decided to try Leriche's operation, and we denuded the third part of the axillary and the first part of the brachial artery for one and a half inches. The result was dramatic. On the day following operation the typical dead white areas were replaced by pink vascularity, the gangrenous area sloughed off quite superficially, and a very useful finger has resulted. What is more, the improvement of her condition has persisted, and you will agree that the recent wintry weather has supplied an exacting test. We intend operating on the other limb in the near future.

I do not know enough of this operation to dogmatise generally. More extensive experience is required. But this case, at any rate, has been most successful, and is a distinct encouragement to approach others of a similar character.

IN THE MEDICAL WARDS OF THE PRINCE OF WALES'S GENERAL HOSPITAL

WITH

DR A. J. WHITING.

THERE are several patients at present in the wards whose cases illustrate fairly well some different causes of heart failure and I should like to draw attention particularly to them.

I have the opportunity of exhibiting three or four cases of heart failure associated with auricular fibrillation. As is well known among the ordinary overt indications of this pathological state, in the patients who are not under appropriate treatment with digitalis or one of its allies, are: (1) a completely irregular heart-beat, the *pulsus perpetuus irregularis*, no two consecutive beats being alike; (2) a rapid heart-rate 120 or perhaps 140 or more per minute; (3) signs of heart failure, at any rate in the severer cases, such as dyspnoea on exertion or at rest, so that the patient may not be able to lie down or may require a number of pillows under his head, the number required affording a rough index of the degree of cardiac embarrassment; or gauged in another way in the persons who are orthopnoic the varying inability to hold the breath, for a few seconds only, or not at all; (4) there is often cedema, of the type of anasarca and ascites, with signs of congestion of the viscera, an enlarged liver, slight albuminuria, cedema of the lungs with an irritable cough which comes and goes as his condition varies in degree; and (5) a feeling of distress which likewise waxes and wanes and disappears in a remarkable way when the normal rhythm is restored either spontaneously, in the early cases marking the end of a paroxysm, or as the result of treatment with digitalis or quinidine.

On the analytical side, the main thing in addition to the arrhythmia is the absence of an auricular wave from the jugular pulse curve indicating virtual paralysis of the auricle. If, however, the patient is or has been recently under treatment with one of the digitalis group of remedies the ventricular rate may be quite regular, and it is then that the electrocardiogram or polygram showing the absence of the auricular waves is of especial value in diagnosis.

CASE 1 is that of a man, aged 39, who, as you see, is greatly emaciated suggesting the possibility of some malignant disease, possibly of the digestive organs. This was the first thing, indeed, that attracted attention when he came to the out-patient room, being sent up by his medical adviser. As he was obviously very ill he was forthwith taken into the ward.

Careful examination failed to elicit evidence of any gross structural disease in his abdominal organs. [X ray plates of the abdomen were shown.]

On examination of his lungs there were found signs of old tuberculous disease which were confirmed by X ray