Other points in the clinical examination of the case, such as the general condition of the patient, his physical form, and the state of his nervous system, assist in the diagnosis, but the differential diagnosis of the varieties of constipation is one of considerable difficulty, and can only be made in some cases by x-ray examination.

Radiographic Diagnosis.

In order to avoid the description of the radiographic appearances in the different forms of constipation a series of films illustrating the several varieties of constipation was shown. Not only is radiographic evidence useful in confirming, or otherwise, a clinical diagnosis, but it is of particular value in excluding certain forms of organic disease, such as diverticulosis, early carcinoma, and other forms of organic disease which may be difficult to exclude with certainty by clinical examination; it is also invaluable in the accurate diagnosis of those cases in which more than one variety of constipation is present at the same time—as, for instance, the coincidence of spastic constipation and rectal dyschezia.

*Treatment of Constipation.*⁵

The first object of treatment is to obtain a regular action of the bowels with the passage of a formed stool. Just as mental depression and emotional distress are responsible for constipation, and just as fear and fright may cause diarrhoea, so constipation is itself responsible for a sense of depression and fatigue, and the constant passage of loose stools over a period of years is the cause of nervous exhaustion, and its cardinal symptom, fear. The second object of treatment is to secure a regular and complete evacuation of the bowels by the regulation of habits of life and food. The importance of habits in allowing an opportunity for the various reflex mechanisms concerned in bowel activity to have an opportunity for their action has already been alluded to. The need for caution in advising anyone to change his dietetic habit has already been indicated; at the same time it is obvious that rectal dyschezia requires a full-residue diet and a soft stool to assist complete evacuation of the rectum, while an irritated condition of the colon, such as is present in spastic constipation, must be given rest by the prescription of a low-residue diet, which will save the tired and irritated bowel from unnecessary stimulus. The third object of treatment is to find a drug, where drug treatment is necessary, which will promote the passage of a formed stool without pain or discomfort, and one which can be used without variation, if necessary for years on end, in minimal but adequate dosage. If the laxative employed requires changing from time to time it is evidence that it is unsuitable for its purpose. Remembering always that the movements of the colon are considerably more sluggish during the night than during the day, it is important that it should not be unduly stimulated by an evening laxative. Excessive colon activity, due to taking laxatives at night, is a common cause of insomnia, and there can be little doubt that almost as much disease and distress of a low-grade and chronic type is caused by the habitual use of laxatives as results from the abuse of alcohol and other stimulants.

In dealing with disorders of the bowel, whether of functional or organic nature, the result of bowel activity must at least be seen, if not examined in a more detailed manner. No man would venture an opinion on the condition of the kidneys without examining the urine, and no man can give a final opinion on the condition of the bowels without seeing the stools. Apart from the completeness of digestion of food residues, which can be largely judged by the inspection of the stools, and apart from the presence of mucus, pus, and blood, which may be an indication of organic disease, the size and shape of the stool provide an indication of the state of tone of the rectum and anal sphincters; the bulk of the stool gives some idea of the patient's diet and rate of passage of food residues through the bowel, and the fact of the last part of the stool being soft or semi-solid is a good criterion that evacuation has been complete.

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POSITION OF SURGERY IN THE TREATMENT OF GASTRIC AND DUODENAL ULCERS.*

BY

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A SUMMARY of the statistical records of gastric and duodenal ulcer cases dealt with in the Manchester Royal Infirmary during the past four years may usefully introduce this subject. It should be explained that these records are carefully compiled, and it may be taken that the diagnosis of ulcer has been verified so far as the circumstances have permitted.

1. The average number of admissions per year (1925-28 inclusive) of non-perforated gastric and duodenal ulcers exceeds 400, and of these some 70 per cent. are admitted (directly or by transfer from the medical wards) to the surgical wards. Some 60 per cent. of the ulcers are duodenal or pyloric, and the remainder gastric or prepyloric.

2. The average number per year of perforated ulcers is 135, of which 75 per cent. are duodenal. The mortality rate for perforated duodenal ulcer cases is 12 per cent., while that of the perforated gastric ulcer is 33 per cent.

3. The frequency of haemorrhage as a complication of ulcer cannot be gauged from the hospital statistics, because in the group of cases labelled haematemesis or melaena (or both) there must be a few in which the haemorrhage is due to conditions other than ulcer; furthermore, it must be remembered that only a proportion of the cases of haematemesis are sent to hospital for admission as urgency patients; whilst as regards perforations in the population served by the hospital, almost all nowadays will be sent in for the necessary operation. However, it is worth noting that some 40 cases of haematemesis are admitted each year to the medical wards, and the mortality of these under medical treatment is about 10 per cent.

The figures I have given show that in this hospital—on the staff of which medicine and surgery are pretty equally represented—surgery is still employed in the treatment of the majority of cases of gastro-duodenal ulceration without including the perforated ulcers. I do not suggest that this proves the value of surgery. I merely draw attention to the fact.

So far as the perforated ulcers are concerned, there can be no doubt about the nature of the treatment, and it is gratifying to see the great improvement in the results during the past twenty-five years, though the mortality in the gastric ulcer group still leaves much for the surgeon to improve upon. The improvement in the main is due to the earlier recognition of the catastrophe—it is now quite common for these cases to reach the surgeon within an hour or two of the occurrence of perforation; better surgical technique, too, accounts for some of the improvement. In regard to the latter it is interesting to note the difference of opinion among surgeons as to the scope of the operation for closure of a duodenal ulcer perforation. Some strongly advocate the performance of gastro-enterostomy at the time of the operation for closure of the perforation, unless, of course, the patient's condition is so poor that nothing beyond the essential minimum of closure of the perforation is permissible. It is claimed by these surgeons that the immediate and remote results are better if gastro-enterostomy is done at the time; other surgeons content themselves with closure of the perforation and cleansing of the peritoneal cavity, and only practise gastro-enterostomy in the exceptional case in which there is already pyloric stenosis, or in which stenosis is considered extremely likely to follow on the closure of the perforation owing to the distortion and narrowing of the duodenal lumen which this step sometimes entails.

I do not myself perform a gastro-enterostomy unless pyloric stenosis is present, or apprehended as very likely to follow, and in a series of my own cases, 30 in number, I performed a gastro-enterostomy six times; there were two deaths in the 30 cases, which represents a mortality of 7 per cent. But I must state that in two of the patients on whom I had not performed a gastro-enterostomy I had to do so within three weeks of the operation for closure of the perforation, owing to the appearance of well-marked

* A paper delivered to the Rochdale Division of the British Medical Association on October 16th, 1929.

cumulative vomiting; both these two did well. The mortality of perforated gastric ulcer in the Manchester Infirmary statistics is nearly three times that of the perforated duodenal ulcer; the following factors are responsible, I believe, for this disparity in results: the gastric perforation is commonly much larger than the duodenal perforation, the escape of contents is therefore greater, and the spontaneous sealing up of the perforation by fibrinous adhesions is for the same reason not so often accomplished as it is in duodenal ulcer perforation; the escaping contents from gastric perforation are probably more highly infective; and, lastly, the closure of the perforation is commonly more difficult, and therefore more insecure. In operating on perforated gastric ulcer it is my practice, whenever the closure of the perforation is difficult and unreliable, to perform a high jejunostomy for feeding purposes; this step I strongly recommend in such circumstances. It is interesting to speculate on the risk of perforation which a given patient with ulcer runs; it is impossible to estimate this, and clearly the risk must be much reduced by proper treatment (medical or surgical) of the ulcer. The Manchester Infirmary figures of 400 non-perforated ulcers and 135 perforated ulcers per year represent the proportion of perforations to the total number of ulcer patients as 25 per cent., but the risk cannot be so high as that; possibly 10 per cent.—rather more for duodenal and less for gastric ulcer—may not be far out.

In regard to the treatment of the other acute complication, haemorrhage, there has been a good deal of discussion in recent years as to the advisability of immediate operation for the purpose of arresting the haemorrhage. In the case of a sudden and severe bleeding from an ulcer most surgeons are opposed to immediate operation for the arrest of the haemorrhage, because the majority of such patients recover under medical treatment. Still, in view of the fact that the mortality from ulcer haemorrhage treated by medical measures is not negligible—for it is probably in the neighbourhood of 10 per cent.—it would seem to me unwise to make the policy of non-surgical intervention an inflexible rule. In certain circumstances the advisability of immediate operation should still be carefully considered—for example, the case of the patient who is seen a few hours after the first severe attack of haemorrhage, whose condition is still quite good, and who in other respects is a healthy subject. If it is known, as the result of previous investigation, that the ulcer is duodenal, or, if gastric, is in a position easily accessible, then it is very doubtful if the risk of immediate operation at the hands of a practised surgeon is equal to the risk of non-operative treatment. It is mortifying in the extreme to witness, a day or two later, the sudden reduction of such a patient to a state of intense anaemia as the result of a recurrence of the haemorrhage; the feeling that the golden opportunity has been allowed to pass is irresistible.

There is less room for difference of opinion in the case of persistent or recurrent small haemorrhages, as may be met with occasionally in duodenal ulcer at or past middle life; in this type surgical treatment is strongly indicated.

In the treatment of ulcer patients suffering from severe haemorrhage I would particularly draw attention to the value of whole blood transfusion, as distinct from citrated or defibrinated transfusion; whole blood appears in such cases to have a special haemostatic effect in addition to the well-recognized restorative action common to all methods of transfusion.

The more insidious and chronic complications produced by healing of an old ulcer—pyloric stenosis by the duodenal and prepyloric ulcer, and the less frequent hour-glass contraction of the stomach by lesser curvature ulcers—are well recognized as necessitating surgical treatment for their complete relief, though no doubt much can be done by medical measures for early cases of pyloric stenosis in which the stenosis is due in part to spasm and inflammatory swelling. The striking benefit to be obtained by a well-executed gastro-enterostomy in a patient suffering from cicatricial pyloric stenosis is so well known that it is unnecessary to dwell on it. So, too, the operation of partial gastrectomy in cases of hour-glass contraction of the stomach gives results almost equally good, though with a rather greater risk. It is interesting to note here that

one has met with several cases of pyloric stenosis in which the previous phase of ulceration has been accompanied by such mild and infrequent symptoms that the patient has not sought treatment, or only in a very casual way, till the onset of obstructive symptoms—notably cumulative vomiting—has been produced by contraction of the healing ulcer.

In a consideration of the chronic complications of ulcer an allusion must be made to the relationship of gastric carcinoma and chronic gastric ulcer. That carcinoma does occasionally develop in the edges of a chronic gastric ulcer is certain, but that it happens in any considerable proportion of ulcer cases I do not believe. Knowing what we do about the liability of carcinoma to follow chronic ulceration or long-continued irritation of the epithelial surfaces in other parts of the body, one would be disposed to accept the contention whole-heartedly in the case of the stomach were it not that clinical experience of gastric ulcer and of gastric carcinoma fails to support it. In this paper it is not possible to discuss the evidence, but it does appear to me that the risk of malignancy supervening on chronic gastric ulcer is so small that the contingency should weigh but lightly when we are called upon to decide between medical and surgical treatment. Of course, the position is quite different in that group of gastric cases in which, after full investigation, there remains a doubt whether the lesion is an ulcer or an early carcinoma; in this group operation is strongly indicated.

And now, what of the treatment of the uncomplicated chronic gastric and duodenal ulcer? If we accept the claims made by the physicians in the last few years, then surgery would appear to occupy a small and precarious position in the treatment of this the largest class. This swing of the pendulum towards medicine, particularly in the duodenal ulcer class, is overdue, and must be welcome to many abdominal surgeons because it will make for a higher standard of medical treatment and after-care than has hitherto been attained, and in this way to a more just discrimination in the selection of cases for surgical treatment. That surgery is still very necessary in particular cases, and will continue to be necessary, I do not doubt. One difficulty we have in deciding the relative merits of medical and surgical treatment arises from the fact that, while we have a good deal of statistical information about the late results of surgery, there is as yet not much information available about the late results of medical treatment. That the ulcer in its early stages, before it has attached itself to and eroded other viscera, will heal permanently under efficient medical treatment cannot be doubted—operation and post-mortem observations, as well as clinical experience, establish this. It is also certain that the longer the duration of the ulcer symptoms and the greater the number of relapses before the patient comes under efficient medical treatment, the more refractory will the ulcer prove to this treatment, and the greater its tendency to relapse under the strain of ordinary life. It must be emphasized that the healing of an old-standing ulcer is by no means tantamount to cure, though, of course, it is a substantial step in that direction. I have on three occasions resected the portion of the stomach wall bearing an ulcer which appeared to have healed to such an extent that the unpractised eye would have had difficulty in detecting the existence of an ulcer in the specimen. Yet in these patients their symptoms had persisted up to the time of the operation; in all the history extended over a period of not less than four years, and was marked by severe relapses, accompanied in two by attacks of severe haematemesis. In one a careful radiographic examination failed to disclose the presence of an ulcer, though it showed a persistent spasm of the greater curvature opposite the ulcer site.

There is one type of ulcer, infrequent but distinctive, in which surgical treatment is essential for the complete relief of the patient. The ulcer I have in mind is situated in the posterior wall of the stomach, though usually involving the lesser curvature as well, or in the posterior wall of the duodenum; in either case the ulcer is burrowing deeply into the pancreas. If the ulcer is in the anterior wall of the stomach, then it is attached to and eroding the liver; the ulcer crater, if gastric in position, may be as large as a five-shilling piece. A striking feature of such ulcers is

the persistent pain in the epigastrium and in the back, to the right or left of the lower dorsal spine according as the ulcer is duodenal or gastric. The pain, though constant, is made worse by nourishment, and may necessitate the use of opium, especially at night. Frequently there are repeated haemorrhages. The gaunt, haggard, and anaemic facies of the patient is a characteristic feature. In my experience many of these patients respond very poorly or not at all to the careful medical treatment of my medical colleagues, but a well-planned operation gives immediate and complete relief which, with reasonable after-care, is, I believe, lasting. But apart from such a severe type as this it is not possible to lay down hard-and-fast indications for surgical treatment in the uncomplicated ulcer. We have to consider not only the essentially medical factors—that is, the clinical and radiographic features and the responsiveness of the ulcer to medical treatment—but also the economic and social circumstances of the patient.

A really prolonged course of treatment, to be followed by regulated diet and habits, is an ideal not often realizable by patients of the hospital class, hence the appeal of surgery, with its prospect of a more rapid cure and a reduced risk of relapse under normal conditions of life to this particular class. Without doubt this is the chief reason for the large proportion of ulcer cases in the surgical wards of the Manchester Royal Infirmary. Another factor that enters into the question is the surgeon's faith in his own methods—a faith to be derived and proved from his experience, and not from his impressions.

THE PROPHYLACTIC TREATMENT OF PATIENTS WHO HAVE HAD ALBUMINURIA IN A PREVIOUS PREGNANCY.*

BY

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I HAVE been stimulated to make this preliminary communication on the prophylactic treatment of cases which have had albuminuria in a previous pregnancy by papers by Young and Gibberd. These writers have shown that a large number of cases of albuminuria of pregnancy are followed by permanent renal damage. I must emphasize that this is only a preliminary communication, and the method of prophylactic treatment outlined is still in the experimental stage, but I hope that the details of the cases we have treated will stimulate others to impress on all patients who have albuminuria of pregnancy the necessity in any subsequent pregnancy of placing themselves under expert care at the very earliest moment.

At Queen Mary's Hospital for the East End, where this investigation is being carried out, we have always explained to every patient the urgent necessity of reporting immediately a period is missed, and the majority of patients becoming pregnant again after albuminuria or eclampsia have come under observation at six to ten weeks after the commencement of the last menstrual period. The investigation has been carried out in collaboration with Dr. A. A. Osman, physician to Queen Mary's Hospital for the East End, and Dr. H. G. Close, working for the Medical Research Council.

The theory on which this investigation is based is the result of an extensive examination carried out by Dr. Osman for the Medical Research Council on cases of scarlatinal nephritis, and the essential feature is maintaining the reaction of the urine throughout the whole of pregnancy at a minimum alkalinity of pH 7.7. In order to achieve this it is often necessary to give quite large doses of alkalis by the mouth. To guard against overdosage it is advisable to estimate the bicarbonate content of the blood plasma, and this is done by the method of Van Slyke, Stillman, and Cullen, described in the *Journal of Biological Chemistry* in 1919. This estimation must be repeated at intervals, especially if any change in the original dose is indicated. In normal non-pregnant women the average plasma bicarbonate is about 0.030 molar concentration. In

The scope of this paper is not intended to include a consideration of surgical technique, but recently so much has been written and spoken about the value of gastro-enterostomy in the treatment of duodenal ulcer that a brief allusion may be made to this subject. Many surgeons, probably a considerable majority, regard gastro-jejunostomy as the best operation for duodenal ulcer. My own experience has led me to prefer pyloroplasty—either of the Finney or Horsley type, but when possible the former—combined with excision or cauterization of the ulcer. I believe this operation gives results as good as the best after gastro-jejunostomy, but without entailing the liability to such a grave, if infrequent, sequel as gastro-jejunal ulcer or to the less serious troubles met with after gastro-jejunostomy for duodenal ulcer. Since the foregoing remarks about gastro-jejunostomy for duodenal ulcer were written, the late results in 331 duodenal ulcer patients, on whom gastro-jejunostomy had been performed at the Manchester Royal Infirmary at least five years before the inquiry, have come to hand, and it is noteworthy that 15 per cent. of the patients were found to complain of "slight symptoms" and 13 per cent. of "very definite symptoms."

The inquiry into the late results of gastro-enterostomy which is being conducted at the present time by the British Medical Association throughout the whole country should afford some valuable information about the position of this operation in the treatment of duodenal ulcer, and it was in furtherance of this inquiry that the figures I have just quoted were obtained.

85 per cent. of pregnant women there is considerable reduction, an average being about 0.0247. This blood analysis is somewhat intricate, and cannot be carried out without proper laboratory facilities. The reaction of the urine can easily be ascertained in a very few minutes by colour comparisons with standard phosphate mixtures, using methyl red and brom-thymol blue as indicators. We have found that the dose which is usually both safe and effective is about 400 grains a day of equal parts of sodium bicarbonate and potassium citrate. This may have to be varied according to the reaction of the urine and the bicarbonate content of the plasma. In some cases we have had to give as much as 780 grains—over an ounce and a half a day—while in others the dose may be reduced to a drachm or two a day.

The patient is advised to diet. The protein intake is reduced by curtailing the amount of meat, milk, and eggs. Milk is allowed in tea, coffee, and milk puddings, but is not allowed as a beverage. Eggs are not allowed in quantity, but one egg may be taken every other day. Meat of all sorts, and particularly red or greasy meat, is to be taken sparingly, and only every other day. White fish (not salmon, mackerel, etc.) may be taken freely, and vegetables and fruit *ad lib.*

As regards general hygiene, special attention should be paid to the bowels, and a free action daily must be ensured. Fresh air and gentle exercise are of importance, and at the same time the patient must take plenty of rest and avoid all strenuous exertion.

I will now relate case details of fourteen patients, some of whom have been on a modified treatment.

CASE I.—First pregnancy in 1925. Emergency, after delivery with post-partum eclampsia. Second pregnancy in 1927. Under observation from tenth week. Small doses of alkali only. No albumin. Live baby at term. Third pregnancy in 1929. Under observation from seventh week. Small doses of alkali only. Patient was found to have threadworms, for which she was treated. No albumin. A normal healthy-looking baby died during labour at term. There was no post-mortem examination.

CASE II.—First pregnancy in 1923. Admitted after delivery with post-partum eclampsia. Second pregnancy in 1925. Under observation from eleventh week. Small doses of alkali only. Albuminuria. Premature baby stillborn. Third pregnancy in 1928-29. Under observation from twelfth week. Full alkali treatment (400 grains). No albumin; no oedema. Macerated foetus.

CASE III.—First pregnancy in 1924. Eclampsia. Second pregnancy in 1927-28. Under observation from sixth week. Full alkali treatment (400 grains). No albumin. Live baby at term.

CASE IV.—First pregnancy normal. In the second pregnancy albuminuria and oedema were present. In the third the patient was on full alkali treatment from the twelfth week. No albumin; no oedema. Live baby born at term.

CASE V.—In the first pregnancy the patient suffered from eclampsia. In the second pregnancy she was under observation

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