SOME PRINCIPLES IN THE TREATMENT OF DISEASES OF THE STOMACH.*

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As I pointed out in the first lecture, gastric symptoms may be due to some lesion more or less remote from the stomach, so that in any case of dyspepsia it is necessary not only to pay attention to the stomach but also to treat effectively any associated disease. This principle has been again and again emphasised in the enunciation of the "septic focus" theory, but in my opinion the importance of septic foci as a cause of disease in distant organs has been greatly exaggerated. Obviously, any lesion, whether a septic focus or some other, which may co-exist should be adequately treated; that is merely common sense. If there were a gas-leak in a house no one would refuse to repair the pipe because there was dry rot in one of the floors nor would one expect the stopping of the leak to cure the dry rot. Similarly, it is certain that a majority of the teeth so often and so light-heartedly extracted are in reality perfectly harmless; and even when they are definitely diseased their removal often has little or no effect on other conditions which may be present. I constantly see patients who have had many or all of their teeth extracted without any benefit whatever to the condition for which the operation was performed. A considerable number of "chronic appendices" are also healthy and should never have been removed, unless it be held that every appendix should be removed so as to avoid the risk of an acute appendicitis. With that view, however, I could not possibly agree.

Drug Therapy.

There are extensively employed in the treatment of gastro-intestinal disease certain drugs about which I should like to say a few words. The first is paraffin. Some time ago I wrote a diatribe against this substance which I condemned for three reasons. (1) That it does no good; (2) That it does harm; and (3) That it may cause cancer. The work of Kennaway and his colleagues in the Research Institute of The Cancer Hospital has refuted the last reason. It is now absolutely certain that medicinal paraffin is not a carcinogenic agent. But in my opinion the other two reasons stand. It is horrible stuff to take; it frequently fails to activate the bowels; and it is always liable to pass through unchanged and thus be evacuated involuntarily. At the same time there is a tendency for it to cling to the walls of the stomach and bowels, forming on them a thin film which interferes with absorption of food, and prevents the gastric and intestinal secretions from escaping into the lumen of the alimentary canal, just as mucus may do in gastritis and enteritis. If the paraffin be mixed with other substances, such as agar, I do not see how it can have any effect at all. The only effect of these mixtures is that of the associated substance.

Another drug is bismuth, the only action of which is as an antacid, and for this purpose there are many better. If one wishes to use alkalis, a mixture of sodium bicarbonate, calcium carbonate and magnesium oxide is the best. The sodium salt is very rapid in its action but produces much gas; the calcium salt is slow in its action and the gas is absorbed practically as quickly as it is formed; the magnesium salt neutralises acid without the evolution of any gas. Calcium

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is constipating, while magnesium is relaxing to the bowels. Thus thorough neutralisation of the gastric acids is obtained, and, by varying the proportions of calcium and magnesium, the bowels can be exactly regulated.

The use of charcoal for flatulence is based on a mistaken idea of its properties. Dry charcoal adsorbs gas on to its surface, but wet charcoal has no such power at all. Charcoal in the stomach can neither adsorb gas which may be present, nor prevent the formation of gas in the organ.

Gastric Lavage.

In the treatment of gastric disease, lavage has fallen into very undeserved neglect. It is a most valuable method, but has two apparent drawbacks which are responsible for its disuse. (1) The patient jibs at it. The passage of the tube is unpleasant and repulsive. However, a little persuasion will generally enable one to obtain the patient's consent, and in a majority of cases, after two or three treatments, he becomes so accustomed to the passage, and the improvement in his condition is so obvious, that no further difficulty is encountered. (2) It means the expenditure of considerable time and patience on the part of the doctor. This again is rapidly overcome. Most patients soon learn to pass the tube on themselves and then can perform the whole operation. For cases of gastritis and other irritation of the gastric mucosa, pyloric obstruction, gastric atony, hyperacidity, etc., lavage is the best method of treatment at our command.

The fluid used for washing out the stomach is a matter of indifference. Plain, boiled water is generally as good as anything else. It is generally said that bicarbonate of soda is good if there is much mucus, but I doubt if it has any action on mucus at blood heat. Boil mucus in a solution of sodium bicarbonate and it will certainly dissolve, but that is a different proposition. Antiseptics are useless in this connection. One of the most astonishing things about all the antiseptics used internally (parenterally) is the great care necessary to sterilise them before use. Anyhow, none of them in pharmacological doses can exert any appreciable action in the stomach. The whole benefit of the treatment is due to the mechanical removal of all noxious matter.

Gastric lavage should never be employed in patients suffering from:—

- (1) Acute inflammation of the stomach.
  - (2) Caustic poisoning.
  - (3) Oesophageal or gastric cancer.
  - (4) Advanced cardio-vascular disease, such as auricular fibrillation, valvular disease, aortic aneurysm.
  - (5) Advanced pulmonary disease.
  - (6) Recent hæmorrhage—cerebral, pulmonary, renal, gastric or duodenal.
- It may be mentioned, however, that lavage with ice-cold water has been recommended for the treatment of gastric hæmorrhage.
- (7) Cachexia or extreme exhaustion.
  - (8) Hysteria and neurasthenia.

Criteria for Surgical Intervention.

The treatment of gastric ulcer is tending to become more standardised, and medical methods seem to be coming into their own once more. It may definitely be stated that some ulcers respond to medical methods as well as, or better than, to surgical. For the surgical treatment there are two indications, and in my opinion only two, viz.:—(1) Organic deformity of the stomach, *e.g.*, pyloric

stenosis or hour-glass contraction. (2) Suspicion that the ulcer is malignant. It is obvious that no medical treatment can successfully deal with an organic deformity, but even with a marked degree of pyloric stenosis much may be done without surgical intervention. In these cases the sequence of events is—delayed emptying of the stomach; retention of food over periods of time much longer than normal; fermentation of the retained matter; gastric irritation by the products of fermentation; gastritis and swelling of the mucosa; greater obstruction at the pylorus. If such a stomach be thoroughly cleaned by frequent lavage the gastritis clears up, the swelling of the mucosa diminishes or disappears, and the pylorus becomes more patent. In this way it will often prove quite easy to keep the patient in good health, and avoid a surgical operation.

If there be any suspicion of cancer, clearly re-section of the affected part should be done at the earliest possible moment.

Gastro-Enterostomy.

So far as I have been able to determine, surgery is not a very satisfactory way of dealing with a gastric ulcer as such. It is often said that the physician sees the surgeon's failures and *vice versa*, so that each gets a biased view of the problem. Some time ago, I followed up a large number of cases of gastro-enterostomy—done for gastric or duodenal ulcer—not patients who were referred to me because the surgeon had failed, but a series of consecutive operation cases. An apparent cure resulted in about fifty per cent. of the cases, but the very number of different operations which are recommended for this condition is evidence that none is really satisfactory. About one in three is a complete failure and I suspect that this even is an optimistic estimate.

It may be of some interest to consider the theory on which the operation of gastro-enterostomy is based. The operation may be effective in either or both of two ways. (1) By altering the course of the digestive processes which go on within the stomach; and (2) by removal of mechanical factors which prevent healing.

(1) It is very difficult to conceive any direct effect of this operation other than the relief of gastric stasis: the organ is thereafter emptied more rapidly than when the pylorus is the only route of exit for its contents. But it may be that this has indirect results which are of importance. The shorter the stay of food in the stomach, the less complete will be its digestion. The various principles, particularly proteins, will be less completely broken up; and it is possible that certain of the end-products of protein digestion which act as irritants are hindered from producing or perpetuating ulceration of the stomach wall. For such a supposition, however, there is no evidence, since no substance possessing such harmful properties has ever been discovered amongst the products of digestion; and it seems unlikely that substances normally present in all stomachs should be noxious to some and not to others.

But while it is impossible to show that gastro-enterostomy removes some noxious principle from the stomach, it appears more than likely that it increases the acidity of the gastric contents. The secretion of gastric juice is to a large, even a preponderant, extent excited by appetite or by reflex stimuli originating in the mouth or naso-pharynx through the senses of taste and smell. The cause and effect are not of equal duration, and the secretion of hydrochloric acid continues for some time, often hours, after the stimulation has ceased. If, then, during this period of active secretion the stomach be full, or partly so, the acid

will be to that extent diluted, and its concentration will remain at a comparatively low level. If, on the other hand, the contents of the organ be rapidly evacuated, the acid secreted into the empty, or almost empty, organ is little, if at all, diluted and its concentration therefore rises to a higher level. Thus the hyperacidity commonly associated with a gastric ulcer is not modified by gastro-enterostomy. Moreover, recent work seems to show that hyperacidity is not the cause but the effect of the ulcer.

Another factor also plays some part in this connection, the alkaline duodenal contents. It may be that through the stoma, which allows the stomach contents to pass out, fluid from the duodenum may pass in and, by dilution and neutralisation of the gastric secretion, lower the acidity of what remains in the organ. Attempts have been made to show that this does take place, but no proof has yet been adduced. Normally, there is in the course of digestion, a reflux of bile and pancreatic juice through the pylorus into the stomach; but that the stomach after gastro-enterostomy contains more of these fluids, and earlier during the period of digestion than in the normal course of events, remains yet to be shown. With a properly performed operation, *i.e.*, without any spur projecting into the stoma, the path of the intestinal contents should be from duodenum to jejunum—the lumen is free and there is the force of gravity: there is no reason why they should be raised against gravity into the stomach.

There is then no obvious reason for believing that gastro-enterostomy in any way affects fundamentally the chemical processes which occur in the stomach during digestion: and evidence is accumulating that the amount of acid in the stomach plays no part in the ætiology of gastric ulcer. It seems probable, as already mentioned, that hyperacidity is due to the ulcer, not the ulcer to hyperacidity.

(2) The other suggestion—that gastro-enterostomy is beneficial by reason of the fact that it allows the evacuation of irritating substances contained in, or derived from the diet, substances which, by their physical properties, irritate the surface of the ulcer and keep it open—cannot be denied. But surely it is somewhat drastic to submit the patient to the pain and risk of a severe major operation in order to effect only what can be done with the utmost ease, and with no danger, without any operation? All that is necessary, is so to regulate the diet that none of these irritating substances is included in it.

It is generally agreed that the peristaltic movements of an ulcerated stomach are interfered with to a greater or less degree, and the suggestion has been made that gastro-enterostomy may give relief merely because the circular muscle fibres of the stomach wall are divided, with consequent disappearance of spasm. In the first place, by no means all cases of gastric ulcer show any spasm. In the second place, the spasm is usually opposite the site of the ulcer so that if the latter be near the cardia no gastro-enterostomy can be made proximal to the spasm, and if distally placed it cannot affect it one way or the other. Thirdly, the real evil is not that spasm occurs locally in the stomach wall, but that the ulcer blocks the passage of the peristaltic waves, and gastro-enterostomy therefore will merely aggravate or complete an already existing trouble.

Whether or not one accepts this operation as the proper treatment for gastric ulcer, it must, I think, be admitted by any unprejudiced person that it is a purely empirical procedure, and that its mode of action is quite unknown. Moreover, the advocates of the operation are in somewhat of a dilemma. It is universally admitted that where there is no organic lesion of the stomach a gastro-enterostomy should never be performed, that it is not only useless but harmful. But if it be

performed for an ulcer and the ulcer heal, then the patient is left with no organic gastric lesion but with a gastro-enterostomy—a condition not only useless but harmful. Of course, if it could be proved that the operation is successful in a large proportion of cases then no theoretical objection would hold, but no such demonstration has been made.

Gastrectomy.

If it be decided to employ surgical measures, then resection, either local or by partial gastrectomy, is probably the best method. If there be any suspicion that the lesion is malignant there is no alternative. But the risk attending this operation is distinctly greater. It must also be kept in mind that if a large part of the organ be removed there is a liability to post-operative anæmia of the achlorhydric type, so that the patient must be kept under observation for some years, and suitable treatment is called for as and when necessary, *e.g.*, liver and hydrochloric acid.

Many medical treatments have been advocated and tried out, but all except one have proved of little or no use. Diet and alkalis, vaccines and sera, may possibly relieve symptoms for a time but do not cause the ulcer to heal. Here I may mention that no treatment can ever hope for one hundred per cent. of cures. Whenever an ulcer heals or is excised the cause of that ulcer remains, and may, often does, cause the formation of another, or the breaking down of the scar. Until the cause is known and removed this risk must ever be present.

Duodenal Intubation.

I am convinced that the only efficient medical treatment for gastric or duodenal ulcer is by duodenal intubation. In the treatment of any inflammatory lesion the first and most essential element is rest, and by duodenal intubation alone can the stomach be given rest. No food enters the organ and so there is no irritation of the mucosa, and no stimulus to peristalsis.

The method was devised by Max Einhorn in America some short time before the War, but it was not till about 1921 that my colleague, Dr. Ernest Young, introduced it into England and a few months later, and quite independently, I also adopted the method. Since then our results have led a number of others, both physicians and surgeons, to follow our example.

The technique of the method is perfectly simple. The apparatus consists of a cylindrical glass funnel which may conveniently be graduated in ounces and is capable of holding half a pint. To the outlet is applied a rubber tube fitted at the other end with a glass adaptor for connection with the duodenal tube. In the length of the former tube is inserted a vulcanite tap which can be readily taken apart for cleaning. A glass tap is in every way as efficient but is much more liable to injury. The tap is essential to regulate properly the rate of flow of the food from the funnel.

The duodenal tube consists of a thin-walled rubber tube about 5 mm. in diameter to one end of which is attached a small metal bulb. This must be perfectly smooth and rounded so that it presents no sharp edge or projection. It is made in two pieces so that the lower piece screws on to the upper. It is hollow and the cavity communicates freely with the lumen of the tube. The lower piece of the bulb is perforated with a number of holes. The tube should be approximately one hundred cm. in length and at a distance of 40 cm. from the bulb a black ring is marked. The cardia is situated 40 cm. from the teeth so

that when the tube is passed until the single ring reaches the teeth the bulb is engaged in the cardia. At 56 cm. from the bulb two rings are marked and when these lie level with the teeth the bulb should just reach the pylorus. Three rings are marked at 70 cm. from the bulb at which distance from the teeth lies the biliary papilla. Finally four rings are marked at 80 cm., the distance of the duodeno-jejunal flexure.

Ryle's duodenal tube is a modification of Einhorn's. It consists of a rather stouter rubber tube and the metal bulb is entirely encased in the rubber. The bulb is not perforated but the rubber tube above it is. Although this instrument is perfectly satisfactory for test-meals, it is unsuitable for treatment—the thicker rubber tends to incommode the patient, and it is often found that, although an Einhorn's tube is readily tolerated, the same patient complains of more or less discomfort if a Ryle's tube be used.

It is very rare to experience any real difficulty in passing the tube. Dr. Young always does this for himself. He has the patient sitting in a chair while he stands behind with his left arm around the patient's neck. Guiding the tube between the first two fingers of the left hand he slowly and steadily pushes the tube down the oesophagus with his right. No lubrication is necessary.

I do not adopt this plan and practically never participate in the passing of the tube which I leave entirely to the patient. I explain to him exactly what is necessary, and impress upon him the importance of breathing regularly and deeply through his mouth. He then places the bulb on the base of his tongue and swallows. Only very seldom have I found a patient unable to perform the whole operation himself, and when he has failed I have not succeeded in passing it for him until something further has been done. If the tube cannot be passed in the manner described then I perform gastric lavage once, or perhaps twice. The passage of the full-sized oesophageal tube has in every case made the subsequent passage of the duodenal tube a perfectly simple matter.

Having passed the bulb into the stomach, the tube is pushed on till the second mark reaches the teeth. The patient now drinks a tumblerful of water and immediately lies horizontally on his right side. In front of him is placed a watch or clock and he is instructed to swallow half an inch of the tube every minute for twenty minutes, *i.e.*, at the end of twenty minutes the fourth mark on the tube will have reached the teeth and the bulb will be well in the duodenum.

To determine whether or not this is so he is given an ounce of milk to drink and immediately afterwards a syringe is connected with the upper end of the tube and the plunger withdrawn. If the bulb is still in the stomach the milk will be aspirated into the syringe. If the bulb is in the duodenum no milk will be recovered.

If the bulb is still in the stomach the tube must be withdrawn till the second mark reaches the teeth and the procedure repeated.

As soon as it is certain that the bulb has successfully passed the pylorus a feed may be given. The upper end of the tube is connected up with the tube from the funnel, into which the feed has previously been poured and the tap is opened. As a rule an eight-ounce feed is suitable and the tap is so adjusted that it takes 15 to 20 minutes for the whole feed to pass. If the feed goes in too rapidly it causes discomfort or even pain by distending the duodenum. The passage of the feed should not cause any uncomfortable sensation whatever; should it do so the rate of flow should be decreased. It is necessary before and after each feed to inject by means of a syringe 10 or 20 c.c. of warm boiled water through the tube

into the duodenum to ensure its patency and cleanliness. Every fourth day the tube should be completely withdrawn, thoroughly cleaned and boiled, and then re-inserted.

I commence by giving eight feeds a day at two hourly intervals. Each feed consists of eight ounces of milk, and during each day two eggs are given beaten up with the milk. If the patient finds this not sufficient, the amount may be increased, but I never go beyond 10 ozs. for one feed. If more food is necessary, I increase the number of eggs. It is obvious that all food must be perfectly liquid or it will not pass along the tube. Between feeds the end of the tube is stopped by a wooden spigot to prevent the regurgitation of bile or pancreatic juice along the tube. The tube is also anchored by means of a loop of tape passed around the ear. It is undesirable that the whole tube should be swallowed though there is no danger in doing so—the tube will eventually be passed *per vias naturales*.

The patient should be weighed before treatment, and weekly during treatment. Some gain weight, but occasionally a pound or so may be lost during two or three weeks. This amount is of no consequence. A greater loss calls for more nourishment.

Within 48 hours of passing the tube all pain should have gone, and the patient is perfectly comfortable. Persistence of pain after this time should raise a very grave doubt as to the correctness of the diagnosis.

No drugs are, as a rule, necessary but occasionally it will be found that the passage of a feed induces a reflex secretion of acid in the stomach. Whether or not the hydrochloric acid of the gastric juice causes or perpetuates a gastric ulcer, it is at least certain that any considerable secretion of it into an empty stomach gives rise to discomfort or even pain, which can be relieved by alkalis. So small doses of alkali may be given with, or immediately after, each feed. This should not be done as a routine measure, but only in such individual cases as experience the symptoms associated with "acidity".

If the best results are to be obtained, it is essential to control this treatment by means of radiographic examination. The ulcer is visualised before treatment is begun, and then at the end of three weeks' intubation the tube is removed and the stomach again examined by X-rays. In many cases no evidence of an ulcer will then be found: in other cases it will be found that the ulcer is still present but is smaller. In such circumstances the tube must be passed once more and treatment resumed for another fortnight. It will occasionally be found necessary to intubate for a total of seven or eight weeks before the ulcer is healed, but generally the period is much less.

If the ulcer is unchanged, or has increased in size, then the probability that it is malignant is so great that there is no alternative to immediate surgical measures. The same is true if pain persists for more than 48 hours after the initiation of treatment.

Without radiographic control, the state of the ulcer cannot be determined. As I have said, all symptoms disappear practically at once, so that even in the absence of symptoms at the end of three weeks the ulcer, though smaller, may still be unhealed, and a week or two of ordinary diet will restore it to its original size and activity.

Having satisfied oneself that the ulcer is healed, the tube is discarded and the patient gradually returns to ordinary diet. For the first day eggs and milk are sufficient. Next day, custard, jelly, etc. On the third day, fish cream. On the fourth day, pounded chicken. On the fifth day, ham and toast (white bread). Brown

bread should never be taken by persons suffering from a gastric or intestinal lesion. On the sixth day, fruit, spinach, asparagus. And finally, on the seventh day, an ordinary diet.

In this way a large proportion of gastric ulcers can be cured in the sense that all symptoms have disappeared, the patient is leading a normal life on a normal diet, and no lesion can be found radiographically. Unfortunately, every case does not react so satisfactorily, but this is not to be wondered at since the cause of the ulcer is unknown and may still be present during and after the treatment. For this reason a certain number of apparently cured ulcers will later recur, but in so many cases does the cure appear to be permanent that the method is thoroughly worthy of trial, and is certainly not second to any other.

Causes of Failure of Duodenal Intubation.

The causes of failure cannot always be determined but amongst them are:—

(1) Mistaken diagnoses, *e.g.*, the dyspepsia of cholelithiasis or hepatic cirrhosis will not be cured, probably not even relieved, by duodenal intubation. An appendicular lesion may also simulate a gastric ulcer and is quite unamenable to this method of treatment.

(2) Insufficient duration of treatment. As I have already pointed out, intubation must be continued until there is no longer radiographic evidence of ulceration.

(3) Lack of co-operation on the part of the patient or his friends. Unknown to the physician, the patient may be obtaining illicit supplies of food so that all the benefit of intubation is counterbalanced.

(4) Most important of all, the lesion may be not a simple but a malignant ulcer. I know of no means by which these can be differentiated in many cases. I suspect, nay, I am sure, that the clinical diagnosis is often absolutely impossible.

Duodenal Ulcer.

Duodenal ulcers may be treated in the same way. These ulcers are practically invariably situated in the first part of the duodenum, so that it is quite simple to get the bulb of the tube well beyond the ulcer. The tube is passed so far that the bulb reaches the duodeno-jejunal flexure. In all other respects the technique is the same whether the ulcer is gastric or duodenal.

I am not perfectly clear as to the value of duodenal intubation in the treatment of duodenal ulcer. At first sight one feels that the method is less valuable than when a gastric ulcer is present, but further consideration scarcely confirms this opinion. The demonstration of a duodenal ulcer is very much more difficult than that of a gastric ulcer, and altogether the diagnosis is far less certain. A typical case with pain in the typical spot, with hunger-pain, with occasional nausea and vomiting, melæna but no hæmatemesis, is fairly clear and definite; but there are a far larger number of cases where the history is by no means characteristic, but radiograms show an appearance or appearances which are interpreted as an ulcer. Some radiologists maintain that the radiographic demonstration of a duodenal ulcer is always possible, and that a radiographic diagnosis is practically certain. In my opinion, the facts do not substantiate such a claim. The clinical and radiographic diagnosis of duodenal ulcer is always difficult and both methods are subject to a very definite percentage of error both in making a negative diagnosis when an ulcer is present, and in making a positive diagnosis when no ulcer exists. I think that the future may show that most, or at least many, of our failures to cure a duodenal ulcer are due to the absence of an ulcer.