GASTROSCOPY.

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Introduction.

In gastroscopy we have a method of examining the surface of the gastric mucosa which is very similar to cystoscopy. In many respects it is as valuable a method to the Gastro-enterologist as cystoscopy is to the Urologist.

There are many reasons for its present position of obscurity and for the general ignorance of its uses and possibilities. The principal of these reasons is that before 1932 all the instruments commonly used were rigid steel tubes rather like long cystoscopes with a bore of about 1 cm. There was a great danger of œsophageal perforation, which is usually fatal, particularly at the lower end where it inclines to the left to pass through the diaphragm. To prevent this, great skill and constant practice were needed and therefore, for purely technical reasons, gastroscopists were few and gastroscopy little known.

For the patient the discomfort of the rigid instrument passed by an expert is less than that produced by the new flexible Wolf-Schindler gastroscope which was introduced in 1932. During these last four years the Wolf-Schindler gastroscope has greatly increased the popularity of gastroscopy because it is safe to use. It can be passed on a greater proportion of patients and it requires less practice and skill. There remain, however, three factors which will always prevent gastroscopy finding as wide a use as cystoscopy. There is more discomfort and unpleasantness than in cystoscopy, particularly for those people who have sensitive throats, and, while it is uncommon to have men who are afraid of the cystoscope because of its discomfort, a fear of gastroscopy is not so rare. Secondly, because the normal variations in the size and shape of the stomach or in the colour and contour of its mucosa are far greater, the interpretation of what is seen is more difficult and the training of a gastroscopist is longer and more arduous than that of a cystoscopist. Thirdly, efficient radiology can satisfactorily detect medium and large gastric ulcers and the majority of carcinomata when they present themselves for examination.

The Gastroscope.

The Wolf-Schindler instrument (Fig. 1.) is constructed on the same principle as the cystoscope, but the distal 14 inches can be flexed through an angle of 30° and the field remains tolerably clear. Illumination is provided by a strong 12 volt bulb and the tip of the instrument has a sorbo rubber buffer. The shaft carries an air canal through which air is introduced by hand bellows to distend the stomach. The field has an angle of 90° and the view obtained is like that of the cystoscope in perspective and clearness. The very ingenious flexible optical system invented by Wolf has a very large number of lenses and thus the

FIG. 1.

image is not bright enough for efficient photography. Photographs have, however, been taken by attaching a camera to a large bore rigid gastroscope and the best of these cameras is that used by Norbert Henning of Leipzig. The blind method of gastro-photography—the introduction of a camera at the end of a stomach tube—has, in my opinion, no clinical application and cannot be compared with gastroscopy.

Technique of Gastroscopy.

No food is allowed for 12 hours prior to the examination so that the mucosa may be in a standard condition and the interpretation of the findings will not be upset by the hyperæmia which normally accompanies digestion.

The examination is best made on an operating table and although several tables have been designed which can be moved in a vertical plane and rolled horizontally, with a special head-rest for moving the head, I have found these tables unnecessary. The only necessary movement is in a vertical plane. The rolling can easily be achieved by the operator's hand moving the uppermost shoulder of the patient as he lies in the left lateral position. The head is held by an assistant.

The Anæsthetic. General or local anæsthesia may be used. While general anæsthesia has the advantage that the unpleasantness of instrumentation is abolished, any anæsthetic which produces the relaxation required for gastroscopy is not in itself without risk. Also, the œsophagus being relaxed, the air with which the stomach is inflated regurgitates, the stomach collapses and the view is obscured. Gas, ether and oxygen are unjustified unless the patient is having it for another operation, because of post-anæsthetic vomiting and unpleasantness. Evipan has been used on a small series of cases and has been found satisfactory especially for nervous patients. It is given with the patient in the left lateral position ready for the instrument to be passed. I usually use local anæsthesia preceded by an omnopon-hyoscine-atropine mixture: enough is given to bring the respirations down to about 16 per minute. The throat is painted with 2% pantocain. Other anæsthetics have been tried such as psicaine, percain and cocaine. I prefer pantocain because it is less toxic than cocaine and more rapid in its action than percain.

After the throat has been anæsthetised, a stomach tube is passed and the residual gastric juice removed. The patient is now placed in the left lateral position, his shoulders and pelvis must be vertical, his knees drawn up and his arms resting in front of his chest. Without extending the whole cervical spine the chin is raised and the head is held in this position accurately by the assistant. The gastroscope is passed slowly and carefully, the patient swallowing as the tip of it reaches the crico-pharyngeus. No more than gentle pressure must be used at any point. As a rule there is little difficulty in introducing the instrument. After the gastroscope is introduced the stomach is distended with air and the examination is begun. The pylorus is always examined first with as little air as will give a clear view, then the instrument is slowly withdrawn and at convenient intervals the lesser curvature, anterior wall, greater curvature and posterior wall are examined in turn as the instrument is withdrawn in a spiral fashion. In this way a fairly complete view of the stomach is obtained.

The Area of Stomach visible. The area of the mucosa visible depends to a large extent upon the type of stomach, but with all types of stomach the highest part of the fundus, the region of the cardia, the upper part of the lesser curvature and the inferior pole of the stomach are always invisible (see Fig 2). In the high cow-horn type of stomach the antrum is clearly seen as Fig. 3 shows, but in a long

FIG. 2.—The Blind Areas of a "J"-Shaped Stomach.

FIG. 3.—Showing the Pylorus and Pyloric Antrum.

low stomach whose antrum is bent sharply on the body, the lesser curvature beyond the angulus is invisible. It is obvious that included in these blind areas of the stomach there is a large part of the lesser curvature and sometimes the pylorus, and as it is in this region that so many important pathological lesions occur, this is a disadvantage of gastroscopy that must be overcome. There are many methods which we can use to bring these areas into view. On deep expiration the pylorus moves down relatively to the rest of the stomach and thus can be more easily seen. By palpation through the abdominal wall the stomach can be displaced sufficiently to bring some areas into better view, and in particular instances this method of increasing the field of gastroscopy has been found of great value. A retrograde objective will also allow a better view of the pyloric antrum (see Fig. 4). The lesser curvature immediately proximal to the angulus is always clearly visible, but in the upper part as the mucosa approaches the gastroscope, the view becomes indistinct. To allow this upper part of the lesser curvature to be seen, a small

rubber balloon may be attached to the gastroscope immediately proximal to the objective (Fig. 5). If this is inflated the lesser curvature is displaced to the right and is kept far enough away to be seen clearly. By using the balloon the entire lesser curvature above the angulus can be seen satisfactorily. By turning the instrument round, the balloon may be used to pull the cardiac end of the stomach a little upwards to increase the visibility of the fundus.

With the right-angle objective the inferior pole of the stomach is always invisible. As most gastro-enterostomy stomata lie somewhere near this spot they may be incompletely seen, and for this purpose a prograde or forward-looking objective may be advisable, but it gives an indistinct view and I have found that in a certain series of 35 gastro-jejunostomies, 15 were seen completely, 12 more than half, 7 less than half, while in 1 it was not seen at all. So that in almost 80% of cases the stoma is seen satisfactorily with the usual right-angle objective. Further experience has only confirmed this view.

FIG. 4.—Retrograde Objective showing the increased visibility of the Pyloric Antrum.

FIG. 6.—Showing the use of a Prograde Instrument in examining the Inferior Pole of the Stomach.

Colour of the Mucosa. The normal gastric mucosa is a deep orange-red colour. It is, however, difficult to decide in any particular case whether the mucosa is paler or darker than usual. A duodenal tube on which three bands of colour have been painted can be used as a standard against which to compare the colour of the mucosa. The tube is introduced before the gastroscope instead of the larger stomach-tube. Through it the fasting juice is aspirated and it is kept in position. This adds little, if anything, to the difficulty in passing the instrument, or to the patient's discomfort.

Complications of Gastroscopy. The most serious complication of gastroscopy is perforation of the oesophagus. This has not occurred in any case coming within my experience although I have been told of two cases in which an experienced gastroscopist perforated the stomach wall in the case of a necrotic carcinoma. Henning has not met with this accident in nearly 3,000 gastroscopies. At least 50% of patients have some soreness of the throat starting a few hours after the investigation is over. This is not usually severe enough to need aspirin but a routine mouthwash and gargle as soon as the pantocain has worn off lessens the discomfort.

The Value of Gastroscopy.

The chief object of this article is to indicate the use of the gastroscope in routine medicine.

The patient who has dyspeptic symptoms can have, as a rule, only a provisional diagnosis given him after the usual routine consulting room examination. The diagnosis of inoperable carcinoma of the stomach is sometimes easy on purely clinical examination. But most lesions of the stomach require special investigations for this diagnosis to be firmly established. Radiology, which is the most

FIG. 5.—To show the position of the Balloon which when inflated can displace the Lesser Curvature.

important of these special investigations, has been so successful in demonstrating the presence of carcinoma and ulcer that there has been a tendency to divide gastric disease into three groups—carcinoma—ulcer—and the rest. The latter group includes a great variety of diseases whose names depend more on the educational prejudice of the individual than on the anatomical basis of the disease. It is in connection with this residue that the gastroscope finds its most useful application. But before we proceed to consider this group let us consider of what value it is in cases of ulcer and carcinoma.

The Value of Gastroscopy in Innocent and Malignant Gastric Ulcer.

Carcinoma—Fifty per cent. of the carcinomata recently seen by me were obviously inoperable at the first examination. Of those admitted for operation only ten out of twenty-six were operable. Now in all these twenty-six cases there was no delay in making the diagnosis after the patient reached hospital and so the gastroscope could not have helped. In the ten cases which were operable, five had not been diagnosed by X-ray examination and were first detected by the gastroscope. But here I am bound to add that a less busy radiologist would probably have diagnosed three of these five and possibly all. So the gastroscope will bring down only a small percentage of the total carcinomata seen, but—and this is the important point—those which are diagnosed by this method will fall in the operable group among the fortunate few.

Innocent Gastric Ulcer—In gastric ulcer the surgeon will find very little use for gastroscopy, for an ulcer large and chronic enough to require removal will be demonstrated by any radiologist, but smaller ulcers, the larger flat callous ulcers and the acute ulcers may escape detection even after a careful X-ray examination. If these patients are left untreated the ulcer will become worse and more difficult and tedious to cure, but if a diagnosis can be arrived at by means of gastroscopy, treatment can be adopted which will save a great deal of trouble later. The results of medical treatment can also be better controlled by endoscopy and it is almost the rule to see an ulcer not completely healed which shows a smooth outline on the screen and in the skiagram. The benefits of further treatment in these cases are obvious and, it may be, that the too early cessation of medical treatment caused by negative X-ray examination, leads to many cases of failure.

Other Varieties of Dyspepsia—Among the other types of dyspepsia are found innumerable varieties, but they have this in common, that none of them have shown an ulcer or carcinoma on the screen, and as a rule the X-ray examination is described as “negative,” or may show some abnormality of motility or shape. Inflammation of the mucosa cannot be diagnosed by radiology with any degree of certainty. Although Berg and others have used a special technique for examining the mucosal pattern and claim considerable diagnostic accuracy, my colleague Dr. George Simon has not been able to show any constant correlation between the gastroscopic picture and the mucosal pattern, and we are of the opinion that it has very secondary place in the diagnosis of gastritis.

The fractional or histamine test meal is of very little use in the diagnosis of gastric lesions, but it is of the greatest help in diagnosing the type of stomach and its findings greatly influence treatment.

Having drawn a blank in these cases with routine clinical investigation, radiology and test meal, we must look to gastroscopy for help, and I can best show its use by giving a short account of the cases which have come to me for examination.

In the first group are those cases of young men, usually under the age of 40, who have suffered from almost continuous dyspepsia for a year or more. Their chief complaint is flatulence and a heavy feeling of discomfort or pain in the epigastrium after meals. Their symptoms have no definite periodicity and the character of the pain and the means for its relief are very varied. All the methods of investigation are negative, but gastroscopy shows an inflamed mucosa with swollen folds, occasional erosions and the presence of muco-pus between the folds. These patients are, I believe, frequently put off with tonics and treated as neurotics, but when their condition is suitably treated, improvement almost always results.

A similar type of case is gastritis usually occurring in older patients who have similar, though more indefinite histories, but as carcinoma is excluded by X-rays, one is apt to lose interest in them. The presence of a gastritis may be proved by gastroscopy and with attention to dental cleanliness, diet and regulation of meals, they may improve enough to surprise the clinician who diagnosed them as malignant disease on his first examination.

The neurotic patient who has ærophagy and complains of flatulence may have, as the basis of his disease, a catarrhal gastritis. The mucous covered mucosa cannot absorb the air normally swallowed with food and the gastric distension which is caused makes the patient want to bring up wind. He finds this difficult, just as so many nervous people find it difficult to obtain perfect control over other sphincters—in micturition or defæcation for example—and to help his belching he swallows air and makes a habit of it. Causes for this air swallowing, such as post nasal catarrh, are commonly recognised and dealt with. Gastritis is another common cause and its treatment should be included in the therapeutic plan.

The gastritis caused by eating bad food with improvement in a few days is also well-known, but the gastroscope teaches us that the inflammatory state of the mucosa long outlasts the symptoms and, perhaps a few weeks later, because of overwork or overworry, the inflammatory changes rise above the threshold of sensibility and symptoms reappear. This time it is labelled "nervous dyspepsia" and treated as such.

Post-operative dyspepsia is a very common disease and is most often seen in those people who suffered gastro-enterostomy without adequate cause in the infancy of gastric surgery. This variety of gastric discomfort may be due to many causes, among them is a severe gastritis with great production of pus and mucous, usually from the mucosa of the body of the stomach. Under treatment, which includes a strict ulcer diet and gastric lavage, these people may improve considerably. If, however, their symptoms are due to some mechanical or intestinal lesion, and the gastroscope shows no such gastritis, this same treatment may only do harm.

In pernicious anæmia and simple achlorhydric anæmia (Witt's anæmia) there is quite constantly found a thin atrophic mucosa, usually worse in pernicious anæmia than in the other. If an inflammatory change is superimposed on the atrophic mucosa then it would seem reasonable to hope, that with an improvement in the gastric mucosa, there would be some improvement in the blood picture. Although this is suggested it has at present no evidence to support it.

We may summarize the present position by saying that, in the cases under discussion, the gastroscope gives us a certain means of telling whether the mucosa is at fault or not, and allows our treatment to be better directed giving it a better chance of being effective and decreasing the danger of doing harm.

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