

tonitis. Thus even benign stenoses produce death sooner or later. For these reasons chronic intestinal stenosis wherever situated is a serious affection and one which requires operative treatment. The temptation to postpone operation is peculiarly strong in chronic stenosis unless some complication arises which immediately threatens life.

The operative measures to be considered are:

1. Complete removal of the stenosed portion by resection. This operation is only indicated in malignant tumors whose radical removal seems possible. In tuberculosis and other ulcerative processes the indication for resection is a relative one, dependent not a little upon the technical difficulty of the operation.

2. Simple entero-anastomosis.

3. Complete or incomplete intestinal elimination.

4. Artificial anus.

The technic of these operations, and the special indications for their performance, are given on pages 458 *et seq.*

The most important feature of non-operative treatment for intestinal stenosis is the patient's diet. Solid indigestible substances may change an incomplete into a complete stenosis. In stenosis of the small intestine laxatives work injury by unnecessarily increasing peristaltic contraction, and they are not of service in making fecal matter fluid as it is constantly so in the small intestine. Sometimes opium is of benefit under these circumstances. If constipation exists, it should be relieved by enemata.

In stenosis of the large intestine suitable laxatives may be of great benefit. Usually salines in combination with enemas act favorably to facilitate the passage of feces through the stenosed portion.

GASTRIC ULCER AND ITS COMPLICATIONS.

A gastric ulcer may involve the mucous membrane only or also the deeper layers of the stomach. It shows little tendency to heal, so that it may remain about the same size for months, or even years; or it may gradually increase in size. Gastric ulcer is classified into simple ulcer (round or chronic or peptic ulcer) and traumatic ulcer. Carcinomatous ulcer is spoken of under a subsequent heading.

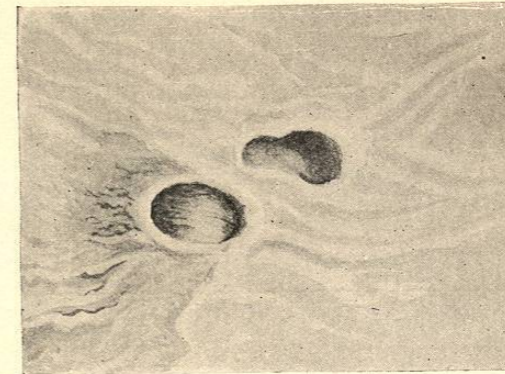
Pathological Anatomy.—Little is known of the exact causes of gastric ulcer, but probably the gastric juice has something to do with the formation of a simple ulcer since it only occurs in places which are accessible to the acid gastric juice. For example, in the stomach itself, in the lower portion of the œsophagus, in the upper portion of the duodenum, and in a loop of small intestine that is connected to the stomach by gastro-enterostomy. It is evident that the gastric juice alone cannot produce ulceration, and there are numerous cases of hyperacidity in which no ulcer is found. There must be some factor which impairs the nutrition of the gastric wall before an ulcer is formed. Traumatic defects in the mucous membrane of the stomach, such as those produced by operations upon the organ, usually heal

quickly without giving rise to ulcer. Spasm of the pylorus cannot be looked upon as a universal cause of simple ulcer since it may exist in common with ulcer of the duodenum. In such cases it is doubtless the result of an ulcer, and not its cause. Moreover, if a gastric ulcer were due to spasm of the pylorus and the resulting changes in motor action of the stomach and the composition of the gastric juice, a cure of the ulcer ought to follow gastro-enterostomy or pyloroplasty. Such cure does not always result. One must admit that the etiology of simple gastric ulcer is not yet clear, while the relations between ulcer, hyperacidity, motor disturbances, and spasm of the pylorus also need further explanation.

Gastric ulcer is a common disease. It is reckoned that it affects from 1.23 to 13 per cent. of the population in different localities. It is twice as common among women as among men. It is rarely seen in childhood. Most of the patients are women between fifteen and thirty or forty years of age, while most of the men affected are between thirty and forty-five years of age. It may also occur at an advanced age.

A simple ulcer is usually situated in the posterior wall of the stomach and in the pyloric half of the lesser curvature. (Fig. 74.)

FIG. 74.



Two ulcers in the small curvature of the stomach, base formed by muscular coat. (Richardson.)

In this comparatively small area are found four-fifths of all simple gastric ulcers. The percentage for the different portions of the stomach are, posterior wall 40 per cent., pyloric portion 25 per cent., lesser curvature 15 per cent., and rest of the stomach 20 per cent. Only 20 per cent. of ulcers are found in the anterior wall. In some cases two or more ulcers coexist.

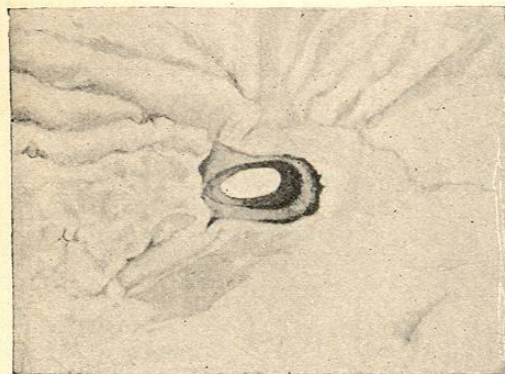
A gastric ulcer varies in size and depth. It may measure several inches in diameter. It is usually round or oval, but may have an irregular shape. In a few cases an ulcer has been found extending completely around the pylorus. The edge of the ulcer is sharp but not elevated, and rarely undermined. Indeed, if the ulcer involves

the deeper layers it is usually funnel-shaped, since each deeper layer is destroyed less extensively than those superficial to it. The depth of the ulcer is not at all dependent upon its extent.

Microscopical examination of a fresh ulcer shows that its base and edges are infiltrated with round cells, while in an old ulcer a good deal of connective tissue is seen between the glands and the other normal structures. Consequently an old ulcer is hard, sometimes almost as hard as a cancer. If the ulcer has existed a short time, the rest of the wall of the stomach is normal or nearly so. In case of hyperacidity or gastric catarrh the mucous membrane will show the changes usually found with these conditions. At a later period of the disease the mucous membrane may be much atrophied. The muscular portion of the stomach may be hypertrophied as a result of pyloric stenosis. Otherwise the thickness of the stomach-wall is normal or even less than normal if the ulcer is large. In this respect the effect of the disease is different from that of carcinoma, since in the latter affection the gastric wall is often abnormally thick even though the stomach be dilated.

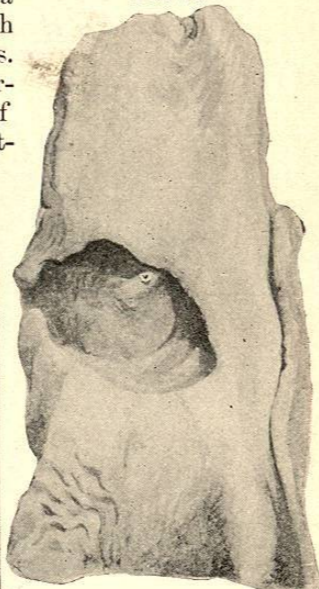
The region of the ulcer is usually hyperæmic, and there is often in addition a hyperæmia of the pyloric region even though the ulcer is not situated near the pylorus. At operation the pylorus is found moderately or firmly contracted irrespective of the seat of the ulcer. The muscular struct-

FIG. 75.



Perforating ulcer of the stomach. (Richardson.)

FIG. 76.



An ulcer of the stomach, showing at its base the open orifice of a vessel: death from hemorrhage. (Richardson.)

ure of the stomach, and especially that near the pylorus, is abnormally sensitive, responding to slight irritation by vigorous peristaltic contraction.

As the ulcer approaches the serosa circumscribed peritonitis results, and if the stomach becomes adherent to the adjacent parts the ulcer may extend through the wall of the stomach and involve the pancreas,

or liver, or anterior abdominal wall. If firm adhesions are wanting, perforation may take place into the free peritoneal cavity or into some portion of the peritoneal cavity which is shut in by adhesions. (Fig. 75.) Protecting adhesions are less likely to form between the stomach and anterior abdominal wall on account of the constant respiratory motion. The ulcer may also perforate into the pleura, pericardium, colon, or spleen. The immediate cause of perforation may be a slight or severe traumatism, or some error in diet.

The perigastritis due to ulcer may lead to well-marked induration so that the scar-tissue may easily be mistaken for a new growth. The adhesions may be firm enough to prevent the escape of gastric contents into the free peritoneal cavity, although they cannot prevent the gradual extension of the process. The patient will then suffer from a subacute infectious perigastritis with symptoms varying according to the situation of the ulcer. Such a condition may be recovered from, the exudate being resorbed while nothing but extensive adhesions mark the site of the trouble. Or a circumscribed abscess may be left which at a later date may perforate into the peritoneal cavity or some neighboring organ or space. The commonest cause of subphrenic abscess of the left side is subacute perigastritis.

Hemorrhage occurs in about 50 per cent. of the cases of simple ulcer. It would occur still more frequently if the thrombosis did not block the affected vessels. The vessels of the gastric wall give rise to small hemorrhages which may be frequently repeated. Profuse hemorrhage is due to erosion of one of the large arteries, usually the gastric or one of its branches, or the pancreatic, less often the splenic or hepatic arteries. (Fig. 76.)

If the ulcer has involved only the superficial portion of the mucous membrane, it may heal without a scar. If it involves the whole thickness of the mucous membrane, its healing leaves a certain amount of scar-tissue which is covered with mucous membrane. An ulcer which extends into the muscular or serous coat heals with a deep connective-tissue scar, since the muscular tissue is never regenerated. Such a scar is usually covered with a single layer of cylindrical epithelium. New ulcers may be formed either in the scar or elsewhere, and sometimes carcinoma develops either in the scar or in the base of an open ulcer. If the scar is situated in or near the pylorus, its contraction may produce stenosis by narrowing or kinking the outlet of the stomach. If the scar is in the body of the stomach and is very extensive, its contraction may produce hour-glass stomach. Cicatricial adhesions following perigastritis may pull upon the stomach and disturb its functions.

Symptoms.—The symptoms caused by gastric ulcer vary according to the size, depth, and situation of the ulcer, the sensitiveness of the individual, and the presence of hemorrhage, perigastritis, or other complications. Thus two ulcers which to all appearances are exactly alike may produce in one patient severe symptoms and in the other none at all. The general condition of the patient depends upon his ability to absorb nourishment and upon the existence or non-existence of hemor-

rhage. If the diagnosis is doubtful and the patient is much emaciated, the lesion is probably a severe ulceration or carcinoma. Such emaciation may also occur with chronic gastritis, gastric atrophy, and even as a result of neurosis. Anæmia and chlorosis are common accompaniments of ulceration. Pulmonary tuberculosis frequently exists, and about 20 per cent. of the patients who have suffered for some time from gastric ulcer die of pulmonary disease. Nervous symptoms are common. So are dyspeptic symptoms, although there is nothing characteristic about them. Constipation is the rule. Diarrhœa is rarely seen in connection with gastric ulcer.

Local pain or burning is a common symptom which may occur spontaneously or be produced by taking food. It is often increased by pressure. Still, in many cases of ulcer pain is wanting, while it also occurs as a symptom of gastric neurosis, carcinoma, gastritis, or gastropnoia. Diseases of the pancreas and duodenum and cholelithiasis may also cause pain not usually to be distinguished from that due to gastric ulcer.

Hemorrhage is the only positive symptom of gastric ulcer, and this is frequently wanting. Leube observed hemorrhage in 46 per cent. of his cases. Müller says it was present in 120 cases which came to autopsy, it being the cause of death in 14 of these cases. Welch estimates that from 3 to 5 per cent. of patients having a gastric ulcer die from hemorrhage. For practical purposes hemorrhage may be spoken of as severe or slight. Severe hemorrhage comes from a large vessel and often causes death. In a few instances it is followed by pernicious anæmia. A slight hemorrhage soon stops so that it does not immediately threaten the life of the patient. If the thrombus is digested by the gastric juice, the hemorrhage may recur. In this way even a slight hemorrhage may recur many times until it produces an extreme degree of anæmia and even death. If the quantity of blood is small, vomiting may not be produced. Even though there is no vomiting the blood may appear in the stools, giving a characteristic tarry appearance. A very small hemorrhage is likely to be overlooked unless a microscopical or microchemical examination is made. Very severe hemorrhage produces the symptoms of acute anæmia, and in this way bleeding may often be recognized even though the patient does not vomit.

Gastric hemorrhage is not an absolute sign of ulceration, since it may occur in cases of portal congestion or thrombosis of the portal vein. There is also a parenchymatous hemorrhage of hæmophilia and hysteria. The hemorrhage from a gastric carcinoma is usually slight and frequently repeated. The blood can easily be found in the vomited material.

Gastric ulcer often produces motor disturbances of the stomach. If it is situated near the pylorus, the cicatricial tissue which it causes may produce stenosis, or stenosis may be caused by the spasmodic contraction of the muscles, or by infiltration of the wall due to fresh ulceration. Even when the normal calibre of the pylorus is pre-

served, adhesions may interfere with passage of the stools. An ulcer although situated at some distance from the pylorus may disturb the motor action of the stomach on account of the reflex pyloric spasm or weakening of the general muscular system. In most cases of gastric ulcer there is hyperplasia of the pylorus, whereas even in the early stages of carcinoma there is well-marked gastric atony.

Riegel calls attention to the hyperacidity of the gastric juice in case of gastric ulcer. This was present 16 times in 21 cases of gastric ulcer in which diagnosis was established by laparotomy. Very rarely is there less than the normal acidity. These changes in acidity are not dependent upon the age of the ulcer. Hyperacidity may also exist in case of carcinoma which has developed in the base of an ulcer, in case of benign stenosis, and in case of gastric neurosis; consequently this symptom is only of relative value, although it is much commoner in connection with gastric ulcer than with other gastric affections. Excess of gastric juice is also common with gastric ulcer, as it is with other gastric affections.

Simple gastric ulcer may be palpable as a tumor either because the hypertrophied and contracted pylorus is itself palpable or because of perigastritis. In the last case the area of resistance will be more diffuse. If the ulcer is so situated that the stomach becomes attached to the anterior abdominal wall, the area of resistance is especially well marked. If the ulceration attacks the abdominal wall, the condition may be mistaken for a tumor of the abdominal wall itself, although the history of the patient and an inquiry for other symptoms of ulcer will prevent such a mistake. Such an adhesion to the abdominal wall will produce great pain either spontaneously or when the patient moves, or takes food, or when the abdominal wall is pressed upon. Contraction of a portion of the rectus muscle in the neighborhood of such a tender spot may also simulate a tumor. (See page 234.) In general, however, the presence of a tumor suggests carcinoma rather than ulcer.

An important complication of gastric ulcer is perforation into the free peritoneal cavity. This may occur spontaneously or as the result of traumatism. Sometimes perforation occurs in a patient who is known to have a gastric ulcer, and sometimes it occurs in an individual who has not considered himself sufficiently ill to seek medical advice. The symptoms produced by perforation of gastric ulcer are the same as those produced by traumatic rupture of the stomach. (Page 257.) There are wanting, of course, the shock of traumatism and the effects of injury of the abdominal wall. Perforation produces intense pain, usually limited at first to the immediate vicinity of the opening in the stomach. The abdominal muscles are firmly contracted. There may be pronounced collapse. The pulse is usually small and rapid. These symptoms gradually pass into those of diffuse peritonitis.

The symptoms produced by a gastric ulcer are by no means uniform. They may be scarcely noticeable, or merely dyspeptic symp-

toms until some complication, such as perforation or hemorrhage, arises. Or the ulcer may heal after months or years and leave the diagnosis in doubt unless the patient dies from some other cause, and at autopsy a freshly healed ulcer of the stomach is found. In other cases the patients suffer from severe disturbances of the stomach, intense pain, and repeated hemorrhages until their strength is exhausted and they are eager to die. Repeated hemorrhage may produce acute or chronic anæmia which may take on a pernicious form. Stenosis of the pylorus may lead to marked emaciation, perforation of the ulcer, perforative peritonitis or perigastritis, and subphrenic abscess. Furthermore, every old ulcer exposes the patient to the risk of carcinoma, since from 3 to 5 per cent. of the cases of gastric carcinoma develop in the base of chronic ulcers. An additional reason why radical surgical treatment of ulcer is justifiable is the fact that about 20 per cent. of patients who suffer a long time from this trouble contract pulmonary tuberculosis with fatal result.

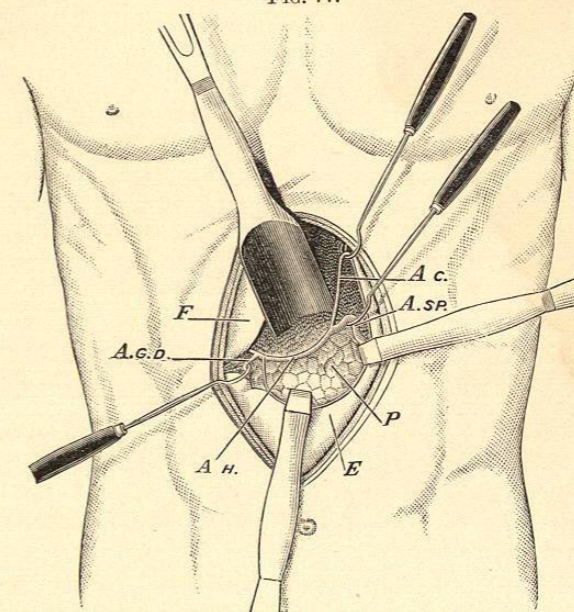
The mortality of gastric ulcer is reckoned with difficulty on account of the uncertainty of the diagnosis. Leube gives it as 2.4 per cent., and Debove and Remond as 50 per cent. Such a wide difference of opinion may be due to the condition in which patients have been observed in hospital or private practice, to the uncertainty of diagnosis, to recurrence after apparent cure, etc. Perhaps an estimate of 25 per cent. as a mortality from the disease will not be wide of the mark. Certainly as many as 25 per cent. of the patients who suffer from gastric ulcer can be permanently cured by proper surgical treatment. The diseases which may be confounded with gastric ulcer are as follows:

1. Carcinoma. More often than is generally supposed, a suspected ulcer of the stomach proves by operation or by subsequent course of the disease to be carcinomatous.
2. Diseases of the gall-bladder and biliary vessels may simulate gastric ulcer. A gall-stone may become wedged in the cystic duct and by perforation or otherwise set up inflammation. It may lead to adhesions which involve the liver, duodenum, transverse colon, or even the stomach. In the presence of such a tumor, and especially if there is no jaundice, a diagnosis of gastric ulcer is easily made. Perhaps the duodenum or pylorus is pressed upon or drawn aside by the adhesions, so that symptoms of pyloric stenosis are added. A gall-stone may also perforate into the duodenum, and in various other ways disease of the biliary passages may lead directly or indirectly to gastric disturbances.
3. Epigastric hernia may interfere with the functions of the stomach. Search should be made for this condition in every case of gastralgia.
4. The question of ulcer of the duodenum should be considered, especially if the patient is a male.
5. In some instances no positive diagnosis can be made even after the abdomen has been opened. There are cases of hysteria and neu-

rasthenia and nervous dyspepsia accompanied by hyperacidity, primary gastric atony, etc., which may lead the surgeon into diagnostic error. The question will then be raised whether some further operation ought to be performed. If the stomach is dilated without pyloric stenosis, gastro-enterostomy is indicated, but experience has shown that in the absence of evident cause for the symptoms operation upon the stomach is not likely to benefit the patient and frequently aggravates the symptoms present.

Treatment.—Operative treatment may be demanded for the cure of simple gastric ulcer or on account of some complication. The treatment of the complications is relatively simple. A perforation should be

FIG. 77.

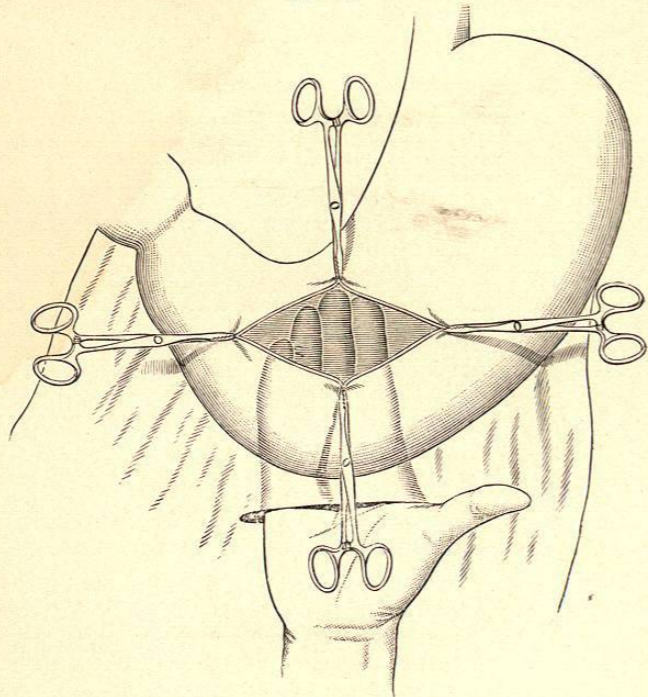


Ligation of the splenic artery for gastric hemorrhage: *F*, liver; *P*, pancreas; *E*, stomach, drawn downward; *A. c.*, gastric artery; *A. sp.*, splenic artery; *A. h.*, hepatic artery; *A. g. d.*, gastro-duodenal artery. (Terrier.)

sutured, a bleeding vessel should be ligated either at the place of hemorrhage or at a distance, and stenosis of the stomach or pylorus should be overcome by a plastic operation or by gastro-enterostomy. The treatment of the ulcer itself is not so clear. Whether incision of a simple ulcer and suture of a gastric wound will be followed by permanent cure is not yet known with certainty. Such an operation has seldom been performed when no complications existed. Only a small portion of the stomach is easily accessible and comparatively few ulcers are situated there. Ulcers of the smaller curvature or posterior wall not infrequently involve the pancreas, while those that are in or near the pylorus are often complicated with pyloric stenosis and require pyloroplasty or gastro-enterostomy.

Simple excision is not likely to produce a permanent cure of gastric ulcer, a disease in which three abnormal conditions are usually present, namely, hyperacidity, pyloric spasm with or without narrowing of the pylorus, and ulcer itself. It should be added that the three conditions are intimately associated. If the narrowing or spasm of the pylorus be overcome, the hyperacidity disappears and the ulcer heals in a majority of cases. At least, symptoms due to it disappear, so that one may fairly assume that it is healed. Consequently surgical treatment ought to overcome or circumvent the pyloric contraction by a pyloroplasty or gastro-enterostomy. If the ulcer is accessible, it may be excised, but the almost certain cure of these patients by gastro-enterostomy alone makes other operation unnecessary.

FIG. 78.



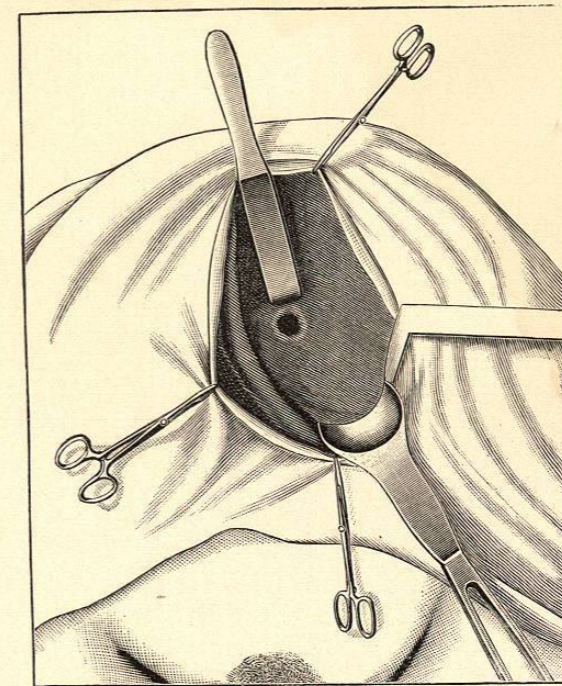
Exploration of the stomach for gastric hemorrhage; stomach opened—hand in lesser peritoneal cavity. (Terrier.)

As stated above, operation may be required on account of the three severe complications, hemorrhage, perforation, stenosis, and also on account of adhesions or the severity of the symptoms of uncomplicated ulcer:

1. Operation may be required after a single hemorrhage which continues in spite of internal remedies and threatens the patient's life, or on account of repeated small hemorrhages which have produced a chronic anæmia. While repeated attempts have been made to find

and ligate the bleeding vessel, only a few surgeons have succeeded. (Fig. 77.) Sometimes the ulcer situated in the posterior wall has already involved the substance of the pancreas so that ligation is out of the question. Successful attempts at ligation have been reported by Roux, Mikulicz, and Witzel. If the eroded vessel lies in the substance of the pancreas, the base of the ulcer may be cauterized or tamponed. If a tampon is employed, the stomach must be left open and a jejunostomy performed to provide for the patient's nourishment. (Figs. 78, 79.) In other cases it is difficult to find the ulcer either

FIG. 79.



Exploration of the stomach for hemorrhage—ulcer in posterior wall exposed. (Terrier.)

because the ulcer is small or hidden in scar-tissue or situated in the region of the cardia. Under such circumstances tamponade of the whole interior of the stomach with accompanying jejunostomy may be considered.

One of the greatest difficulties in the treatment of these cases is to determine whether the hemorrhage which has taken place is so great that any further bleeding will cost the patient's life. One is inclined to wait with the hope that further hemorrhage will not take place, and if it does so the patient may be too weak to stand operation. Moreover, there are instances of spontaneous recovery after hemorrhage which has produced severe collapse: but it is not well to trust to such

spontaneous cure, since 5 per cent. of all patients having gastric ulcer die of hemorrhage.

In view of the uncertainty which attends direct ligation of the bleeding vessel, the proper method of procedure in most cases is an indirect cure of the ulcer by placing the stomach at rest. This may sometimes be accomplished by jejunostomy, which, according to the experience of Heidenhain and others, is a successful operation. No nourishment should be given by mouth for several weeks. It can then be commenced and gradually increased, but not until the stomach proves its ability to handle the full amount of nourishment without fresh hemorrhage is the fistula allowed to close. The shock of this operation is very slight even in a previously anæmic patient. (Page 455.) If the patient's condition warrants it, pyloroplasty or gastro-enterostomy should be performed in addition to the jejunostomy so as to render less likely a new ulceration. Internal treatment with bismuth, etc., should not be neglected.

In case of frequently repeated small hemorrhage the conditions are somewhat different. In such a case one may wait to learn whether internal treatment is capable of stopping the hemorrhage. If it fails, the necessity for operation is sufficiently clear. One ought not, of course, to wait until the anæmia is too pronounced. Operation is demanded less to stop the hemorrhage than to heal the ulcer. If it is accessible, it should be excised, otherwise gastro-enterostomy or pyloroplasty should be performed. The latter operation is indicated if the ulcer to be excised is situated at or near the pylorus. In other respects the operation is similar to that for uncomplicated gastric ulcer.

2. If a gastric ulcer perforates into the free abdominal cavity, laparotomy and suture of the perforation are absolutely indicated. The statistics given on page 221 show the rarity of spontaneous recovery and the advantage of early operation. The symptoms of perforation in many cases are so sudden and pronounced that the diagnosis is nowise in doubt. At other times they are such as to suggest that a perforation is imminent but has not taken place. In these doubtful cases some authors advise delay, but the risk of operation is far less than that of perforation, and as 80 per cent. of perforations occur in the anterior wall of the stomach and are therefore easily accessible, an exploratory laparotomy is the better practice in cases of doubt.

The technic of suture of perforation of the stomach is described on page 412. If the opening cannot be closed by direct suture, it may be covered with omentum or other tissue (page 411); or a tampon may be used and temporary jejunostomy performed.

If the perforation is not a sudden one, but is preceded by a perigastritis, there is less need for immediate operation and the patient can be closely watched. Spontaneous recovery is not infrequent. Or, an abscess may be formed in the subphrenic space or elsewhere which will require to be opened. Another reason for delaying operation in these cases is the inaccessible situation of the ulcer in the lesser curvature or poste-

rior gastric wall. To reach such an ulcer, one must break up adhesions and run the risk of infecting the general peritoneal cavity. Furthermore, adhesions make it difficult to find the ulcer, and when found, its closure by suture may be impossible. When a perigastric abscess has been diagnosticated, it must be opened no matter where situated. The most favorable point for drainage is usually shown by the aspirating-needle.

3. If the ulcer leads to stenosis of the pylorus or to stenosis of the stomach itself (hour-glass stomach), an operation is necessary. This may be either a pyloroplasty or a gastropasty, a gastro-anastomosis, or a gastro-enterostomy.

4. Adhesions between the affected portion of the stomach and the abdominal wall or neighboring organs may require operative treatment. If the adhesions are slight, the motion of that portion of the stomach will be interfered with, and when the stomach is distended the patient may suffer considerable pain similar to that felt in epigastric hernia. A correct diagnosis is not easily made. It is difficult to explain why many operations upon the stomach which must be followed by adhesions lasting a certain time are followed by no pain whatever, whereas in other cases adhesions give rise to intense pain which disappears when they are divided. This operation is spoken of as gastrololysis. (Page 411.)

In other cases the adhesions are so firm that the diagnosis is easily made but the operation is difficult. Thus the stomach may become so firmly attached to the anterior abdominal wall that the ulcer extends into the muscular planes or may penetrate the whole thickness of the abdominal wall. In such a condition extreme pain is caused by direct pressure or by any motion which tends to displace the adherent stomach. Operation is plainly indicated, and should include resection of the ulcer and of the affected portion of the abdominal wall, closure of the stomach by suture, and, finally, suture of the gap in the abdominal wall. The operation is rendered particularly difficult if a considerable extent of the gastric wall is infiltrated, or if the perforation extends into the liver or some other organ. A gap which cannot be closed by suture may be stopped by omentum or tamponed with gauze. The complication of an external gastric fistula does not materially change the nature of the operation.

5. In addition to the four urgent causes for operation mentioned above, there is a fifth class of cases in which complications do not threaten life, but in which the patient is constantly annoyed by pain, vomiting, and lack of nutrition, in spite of a carefully regulated diet and mode of life. If such a patient has been treated medicinally for a reasonable length of time without benefit, and is obliged to earn his living, the indication for operation is sufficiently clear, as mentioned in the preceding pages. Simple excision of the ulcer will often not cure the patient, since the disposition to new ulceration still exists. Furthermore, the ulcer is usually so situated that it is difficult or impossible to remove it. The proper procedure is therefore to facilitate the