RECURRENT ULCERATION AFTER SURGICAL TREATMENT OF GASTRO-DUODENAL PEPTIC ULCER

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by

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IT IS A great compliment indeed to have been invited to deliver the Moynihan Lecture in this College. I am deeply conscious of this honour, which I value as being conferred upon Dutch surgery.

Since the name of Moynihan is attached to this lecture, my thoughts have gone out to this great British surgeon, in whose memory this lecture was instituted. Considering Lord Moynihan's contributions to the advancement of the art and science of surgery, we find that they have been more than can be summarized in a relatively brief address. But above all, his name has become known throughout the world for his exhaustive work in the field of the surgical treatment of duodenal ulcer. He was the first in Britain, and the fourth in the world, to operate on a chronic duodenal ulcer; and he was the first to deal with an anastomotic ulcer following gastro-jejunostomy. I have, therefore, decided that I could best honour his name by presenting a review of my experience in the treatment of recurrent ulceration after surgical treatment of gastro-duodenal peptic ulcer.

I have chosen this subject although I am aware that, on 8th May 1958 this College heard an address delivered by W. W. Davey on the same subject (Davey, 1959). However, whereas he chiefly considered the diagnostic problems, it is mainly with the problems of surgical treatment that I intend to deal.

A great many recurrent ulcers have been treated in the Utrecht University Surgical Department. A series of 200 consecutive cases has been selected from this material to constitute the basis of this study. This restriction has the advantage of permitting us to work with round figures; the time of treatment of these cases, moreover, lies sufficiently far in the past to warrant at least preliminary definite conclusions as to the results obtained.

Although the first gastric resection for benign pyloric stenosis appears to have been performed by the Dutchman Van Kleef, shortly after Billroth's first pyloric resection in 1881, Dutch surgeons have initially confined themselves to gastro-jejunostomy in the surgical treatment of this condition. As long as this operation was carried out for benign pyloric stenosis—was confined to this complication of ulcerative conditions—its results were generally excellent. The process, which had troubled the

patient for years, had healed or was healing; the gastric juice had lost its high acidity, and in many cases there was even achlorhydria as a result of atrophy of the gastric mucosa. Initially, therefore, peptic ulcerations in the vicinity of the anastomosis were not or hardly ever seen.

It was not until gastro-jejunostomy was employed with curative intentions in cases of florid ulcer that recurrent ulcerations were more frequently observed. Berg was the first, in 1898, to describe a jejunal peptic ulcer; he was followed by Braun in 1899. Recurrent ulceration has since become one of the major problems in any form of surgical treatment of peptic ulcer; it is also the most convincing proof of failure of a treatment which, after all, was intended to cause healing of the ulcer or to remove it, and to prevent new ulceration.

It is not my intention to discuss here the pathogenesis of peptic ulcer in general, and that of anastomotic ulcers in particular. In this field we are still largely at a loss. We surgeons regard it as an established fact that the peptic action of gastric juice is one of the most important, if not *the* most important, factor which maintains ulceration. Peptic ulcers, after all, are only found at sites where gastric juice can exert its influence on the tissues. Surgical therapy to-day, therefore, always aims at reduction of the acidity and the peptic characteristics of the gastric juice.

A survey of our series of cases of recurrent ulceration shows that preceding operations in this series include virtually every method of surgical treatment that has been employed for gastro-duodenal ulcer (Tables I and II).

TABLE I

Gastro-enterostomy ..	39
Billroth I	59
Billroth II	100
Vagotomy	2
TOTAL	200

TABLE II

Thirty-four patients had previously undergone two or several operations

Condition found	
Billroth I	6
Billroth II + gastro-enterostomy	3
Billroth II	24
Billroth II + vagotomy	1
TOTAL	34

These cases were divided into Billroth I and Billroth II groups.

The gastro-jejunostomy group

In the Netherlands, as in Britain, gastro-jejunostomy has long been the therapy most widely used in many centres. In the Utrecht University Surgical Department, too, it was only after 1937 that a gradual trend in favour of gastrectomy occurred. And this is the chief cause of the

relatively large number of recurrent ulcers seen following gastro-jejunostomy; our series of 200 cases includes 39 instances of this kind.

Of the entire series, the gastro-jejunostomy group is the one least important to us. For to-day we know that gastro-jejunostomy does not generally constitute an effective therapy for gastro-duodenal ulcer, and that its best results are obtained only in the case of benign pyloric stenosis.

The literature shows a wide diversity of data on the frequency of occurrence of peptic ulceration following gastro-jejunostomy. Figures found range from 0.3 per cent. to 51 per cent.—a diversity probably correlated with the indication on which the operation was based in the series in question. All authors on the subject have made the observation that recurrent ulcerations following gastro-jejunostomy do not as a rule give rise to symptoms until many years after the primary operation; this would seem to warrant the conclusion that recurrent ulceration probably also occurs much later. Only in eight patients in our series did symptoms occur within a year of the operation; in nine others they occurred within two years, but the remainder did not develop symptoms until much later (in some cases after an asymptomatic period of 21, 25 and 27 years) (Tables III and IV).

TABLE III

Interval between primary operation and recurrence of symptoms	*Gastro-enterostomy*
Immediate	8
0–1 year	4
1–2 years	5
2–5 years	6
5–10 years	5
more than 10 years	11
TOTAL	39

TABLE IV

GASTRO-ENTEROSTOMY GROUP (TOTAL 39)

Pain	33
Haemorrhage	12
Perforations	0

Pain was the most important symptom, which was nearly always present. The pain was of varying intensity, and as a rule of a different character from that before the operation. Moreover, it hardly responded, if at all, to dietetic measures or antacids. Stenotic vomiting was seen in three cases; major haemorrhages, giving rise to haematemesis or melaena, occurred in ten cases. Perforations were not observed. In this respect, therefore, our experience differs from Davey's, who reported pain in only 50 per cent. of his cases, but saw haemorrhages in three out of four patients.

The Billroth I group

Only two of the 59 patients in this group underwent a Billroth I resection for ulceration of the stomach. The remainder had had a duodenal ulcer. Three patients in this group had subsequently undergone a gastro-jejunostomy.

In the Netherlands, a technically modified form of the Billroth I procedure has been especially advocated by Schoemaker, The Hague. Since all Schoemaker's pupils perform gastric resection according to Billroth I in all cases of ulcerations in the stomach and the duodenum, and since a number of surgeons in the Netherlands prefer this resection in treating ulcers of the stomach, the number of Billroth I resections in the Netherlands is relatively large. This is one of the reasons why our series includes so large a number of cases of recurrent ulcerations following Billroth I operations.

Particularly in America, Billroth I gastrectomy is currently arousing renewed interest. One of its promoters is Henry Harkins. It is generally recognized that the Billroth I method has certain advantages over the Billroth II modification. The patient's nutritional condition remains at a better level, and dumping symptoms are believed to be less frequent. On the other hand, there is the disadvantage of an increased risk of recurrence, which is estimated at about 10 per cent. Some authors, such as Hutchinson and Kiriluk, maintain that the increased risk should be chiefly ascribed to two factors, to wit: the spatial separation of the alkaline bile and pancreatic juice, and the acid peptic mixture; and the fact that the pyloric sphincter is removed, so that the acid peptic mixture can constantly flow over the duodenal mucosa. They believe that the former factor in particular is of significance, and point out the large percentage of recurrent ulceration observed by Henley following interposition of the jejunum between the stomach and the duodenum; after gastro-enterostomy with the aid of a Roux-en-Y anastomosis, this risk even amounts to 50 per cent.

While the influence of these factors may not be insignificant, they afford no explanation of the fact that the Billroth I method generally yields good results in the treatment of ulcer of the stomach, whereas the relapses chiefly occur following gastrectomy for duodenal ulcer. On the basis of this fact Haberer, after performing 2,000 operations, admitted failure as early as 1939. In my opinion it is plausible that the duodenal mucosa in the case of duodenal ulcer is diseased and, therefore, unsuitable for direct contact with gastric juice. I believe that this is one of the most important causes of the large percentage of recurrences following Billroth I gastrectomy for duodenal ulcer.

Another disadvantage of the Billroth I method lies in the fact that the not very experienced surgeon insufficiently mobilizes the duodenum during the operation for duodenal ulcer, and tends to resect too small a

part of the stomach. The gastric stump was considerably too large in 54 of the 59 patients in our series.

Pain was the predominant symptom; typical ulcer symptoms existed in about half the cases. Haematemesis or melaena was seen in over 30 per cent. of cases, and perforation of the recurrent ulcer occurred in one patient (Table V).

TABLE V

Billroth I group		59
	Gastric ulcer	*Duodenal ulcer*
	2	57
Pain		57
Haemorrhage		19
Perforations		1

In over 60 per cent. of cases, symptoms developed within a year of the operation, and only in nine cases did the relapse become manifest after more than five years (Table VI).

TABLE VI

Interval between primary operation and recurrence of symptoms	*Billroth I*
Immediate	14
0–1 year	22
1–2 years	4
2–5 years	10
5–10 years	6
More than 10 years	3
TOTAL	59

The Billroth II group

This is by far the largest group in our series, and this is in accordance with the fact that the majority of Dutch surgeons employ some modification of this operation on the basis of the Polya principle.

Pain was the predominant symptom. The large majority of patients experienced pain of an entirely different nature than that felt before the operation; this may be ascribed to gross anatomical changes resulting from the primary operation. Major haemorrhages were seen in about 30 per cent. of cases, while perforation of the ulcer occurred in three cases (Table VII).

TABLE VII

BILLROTH II GROUP	
Pain	98
Haemorrhage	31
Perforations	3

In the vast majority of cases, clinical symptoms arose soon after the primary operation; in about 70 per cent. this occurred within a year, and in quite a number of these cases the interval after the operation was only

a few weeks (Table VIII). In general, therefore, the asymptomatic interval is briefest in the case of recurrent ulceration following Billroth II gastrectomy, and longest following gastro-jejunostomy; recurrences after Billroth I gastrectomy occupy a position in between these extremes.

TABLE VIII

Interval between primary operation and recurrence of symptoms	*Billroth II*
Immediate	43
0–1 year	27
1–2 years	13
2–5 years	8
5–10 years	6
More than 10 years	3
TOTAL	100

The vagotomy group is too small to be separately discussed. These cases will be mentioned later, when we discuss therapy.

The diagnosis of recurrent ulceration is known to be difficult on occasions. The main thing is that the possibility of recurrence is taken into account when subjective symptoms are reported. Our investigation has shown that the fractional test is of great importance, despite the gross anatomical changes resulting from the operation, which allow of intensive mixture of gastric and intestinal juice. The purpose of the operation was a drastic reduction of the peptic characteristics of the gastric juice—characteristics generally estimated on the basis of acidity. It was found that the acidity of the gastric juice was too high in 92 per cent. of the gastro-enterostomy groups, 100 per cent. of the Billroth I group, and 94 per cent. of the Billroth II group. This finding is important, for it is an indication that the primary operation did not attain its goal. Apart from this it raises strong suspicions of recurrent ulcerations when found in patients with other symptoms suggestive of possible recurrence.

Testing the faeces for occult blood is of less significance. The benzidine reaction was positive in about 70 per cent. of cases. The fact that it is sometimes repeatedly negative in patients who recently manifested a major haemorrhage indicates the relativity of its significance.

X-ray examination was not made in seven cases because a haemorrhage or stenosis necessitated an operation, or because it was impossible owing to wartime conditions. The results of X-ray examination are not always satisfactory, and it is beyond doubt that X-rays can only be used to full advantage when there is close co-operation between the surgeon and the radiologist. It is surprising to see how some ulcers, even large anastomotic ulcers, can mislead the radiologist and remain concealed from him. Yet, in the majority of cases, the ulcer can be demonstrated or changes can be revealed (stenosis of the anastomosis, rigidity of the anastomosis) which suggest the likelihood of an ulcer. X-rays are an important aid

in other ways also; even when the ulcer cannot be demonstrated with certainty, X-ray findings may be obtained which lend strong support to the diagnosis of recurrence; for example, a gastric stump which is much too large.

The cause of recurrence

Recurrent ulceration always constitutes proof positive of the failure of surgical treatment. It is of importance, therefore, to establish whether some causes of recurrence can be found. The surgical treatment of gastro-duodenal peptic ulceration is always only confined to one of its symptoms; the disease itself is not influenced. It is therefore not surprising that every surgical therapy, however flawlessly executed, has a certain percentage of recurrence. The surgical method almost generally used to-day—gastrectomy—only aims at drastic reduction of the acidity of the gastric juice, and at removal of the ulcer if possible. The average frequency of recurrences following this, fundamentally palliative, therapy is estimated at about 3 per cent. In a consecutive series of 600 non-emergency cases of chronic gastro-duodenal ulcer treated in my department by gastrectomy according to Billroth II, we observed only three cases of recurrence, that is a percentage of 1.5. Despite its shortcomings, therefore, this therapy need not necessarily have a large percentage of recurrences, provided the indication has been correctly determined, and the operation performed without technical flaws.

In this company I need hardly develop the point that gastro-duodenal ulcer is, fundamentally, an internal medical disease, in which surgical therapy is only resorted to when medical therapy has failed. The question, then, is this: when can we say that medical therapy has failed, and which are the requirements to be met by the medical therapy that should precede surgical intervention?

An ulcer is a manifestation of a chronic pathological process which, like any other chronic condition, shows a varying activity. In these chronic pathological processes, surgical treatment is generally not very successful when carried out in the florid stage. It yields the best results when the pathological process is quiescent. Gastro-duodenal peptic ulcerations are not exceptions to this rule, nor do they show a different response to reactivations which may occur in the course of the disease. During this period of reactivation, too, the quiescent process has again become florid and active, and surgical intervention would therefore be undesirable. Before being referred to the surgeon, the ulcer patient should be given a chance to undergo adequate medical treatment, preferably clinical treatment. In this respect, however, conditions are not always ideal. How many patients are referred to the surgeon, at least in Holland, after having had only a single diet cure—at home and without interrupting work? In such cases there can hardly be a question of failure of medical

treatment, because there has in fact been no medical treatment. An operation performed in such circumstances, however flawless its technique, entails a graver risk of failure.

Leaving aside the 16 patients submitted to an emergency operation for perforation or haemorrhage, we find that 69 of the remaining 184 (37.5 per cent.) had never received medical treatment, while 42 (23 per cent.) had been inadequately treated either at home or, sometimes, clini-

Fig. 1. Considerably too large gastric stump after Billroth I gastrectomy.

cally; some 60 per cent. of cases, therefore, reached the operating-room without adequate medical treatment. This shows that the yardstick applied in determining " failure of medical treatment " (and therefore in determining surgical indications) is by no means always a reliable criterion.

But not only did the indication leave much to be desired in many cases, imperfections of surgical technique were also found in the large majority of cases. Excluding the gastro-jejunostomy patients, we find that the 59 cases of Billroth I gastrectomy include 54 cases in which the gastric stump was considerably too large. Among the 100 cases treated by gastrectomy according to Billroth II (Polya), there were 76 in which serious shortcomings were found, to wit:

Gastric stump of excessive size 64
Pylorus with antral mucosa left behind.. 28
Roux-en-Y anastomosis 2
Excessive length of afferent loop of the gastro-jejunostomy with entero-anastomosis 7

TABLE IX

		Gastric stump too large	*Pyloric and antral mucosa*	*Roux-en-Y anastomosis*	*Excessive length afferent loop gastro-jejunostomy with entero-anastomosis*
Billroth I group	59	54			
Billroth II group	100	64	28	2	7

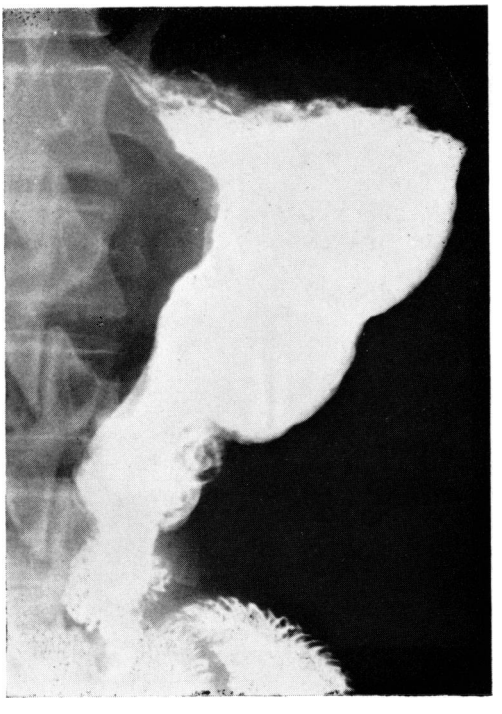

Fig. 2. Gastric stump of excessive size after Billroth II gastrectomy.

In my opinion, the literature pays insufficient attention to this important cause of recurrent ulceration. For, whereas the risk of recurrence following a well-performed gastrectomy is relatively small (as demonstrated in our own series), this risk must be much graver after operations which fail to reduce, to a considerable extent, the peptic characteristics of the gastric juice.

In this company I need not explain in detail that, in ulcer cases, removal of only the pyloric antrum as a rule ensures insufficient reduction of gastric acidity to prevent recurrence of ulceration. A large part of the stomach must be removed if such a reduction is to be effected.

Armstrong and Penick—in a study of 462 cases (1960)—have re-emphasized the fact that recurrences are much more frequent following conservative resection than after radical resection. To sum up, I regard a resection which is too conservative as a technical error.

The pylorus and part of the antrum are left intact especially in the resection according to Finsterer (1952). Flörcken and Steden (1926) were able to establish that this operation is followed by recurrence of ulceration in some 44 per cent. of cases. This is explained by the fact that the chemical or antral phase of digestion is activated by the antral mucosa remaining *in situ*, and proves to be particularly intensive in these circumstances because the mucosa comes into contact only with the alkaline intestinal juice from the duodenum.

The Roux-en-Y gastro-jejunostomy has long been known to entail a grave risk of recurrent ulceration, even after gastrectomy. This has been ascribed to the fact that the neutralizing influence of the intestinal juice is virtually lacking. The same applies if an afferent jejunal loop of excessive length is used, and if a Braun's entero-anastomosis is made between the afferent and the efferent loop.

TABLE X

Operation technically correct	29
Previous treatment insufficient in these cases ..	18
Indication and operation correct	11 (5.5 per cent.)

The finding that the surgical treatment of the primary ulcer was inadequate in the large majority of cases of recurrence indicates an important factor which, in my opinion, greatly contributes to recurrence of ulceration.

In the 29 cases in which the primary operation had been technically flawless, the correctness of the indication was verified. In 18 cases preceding medical treatment proved to have been inadequate, so that only 11 cases (5.5 per cent.) remained in which the surgical indication had been correct and the operation technically flawless.

This observation warrants the conclusion that recurrence could have been prevented in the majority of cases.

During every operation for recurrent ulceration, the pancreas was carefully examined for the presence of an ulcerogenic tumour of the kind described by Ellison and Zollinger (1950, 1956). In two cases, the presence of such a tumour was considered not to have been excluded with certainty, and part of the pancreas was consequently resected. However, no islet-cell tumour was found, nor hypertrophy of the islets.

Therapy

The general experience indicates that—unlike primary gastro-duodenal ulcers—recurrent ulceration shows an exceedingly poor response to medical treatment, which can be expected to yield results only in exceptional cases. More than 50 per cent. of our recurrence patients had had one or more unsuccessful courses of medical treatment. Taking into account, moreover, that the risk of complications such as perforation and haemorrhages is particularly grave, it is obvious that operation must not be postponed too long.

The surgical treatment of recurrent ulceration poses the difficult problem of the method to be employed. It is obvious that previous surgical treatment has been insufficient and, if the cause can be found in technical shortcomings, then these must obviously be corrected. If the recurrence followed an operation which normally has a large percentage of recurrences—I am referring to gastro-jejunostomy and Billroth I gastrectomy, particularly in duodenal ulcer—then it is reasonable to select another operative method which, according to general experience, has the smallest percentage of recurrences: in fact, Billroth II gastrectomy in one of its modifications. If this method has been used in the primary operation, but not without technical flaws, then the problem is not so very difficult: the imperfections must be corrected. A more difficult question arises if recurrence is seen following a Billroth II gastrectomy, performed for the correct indication and with reasonable technical perfection. We have seen that it is precisely this group that constitutes only a small minority in our series. This problem will be discussed in detail later.

In the vast majority of cases, a Billroth II resection or a corrective gastrectomy seems indicated. This was in fact done in each of the 39 cases of the gastro-jejunostomy group, in 54 of the 59 cases of the Billroth I group, and in 86 of the 100 cases of the Billroth II group. A vagotomy was performed in the remaining 21 cases.

In the entire series of 200 patients we had four postoperative deaths (2 per cent.); death was due to suture leakage in two cases, embolism in one, and irreversible shock in one case.

Although I feel reasonably sure of the technical correctness of the corrective gastrectomies—all of which were performed by myself—the results have been disappointing. Another recurrence was seen in no fewer than 19 of our patients, that is about 10 per cent. of the total. These 19 recurrent ulcers can be divided as follows:

in the gastro-jejunostomy group, 4 recurrences among 38 survivals;
in the Billroth I group, 4 recurrences among 51 survivals;
in the Billroth II group, 9 recurrences among 85 survivals.

The remaining two recurrences were seen following vagotomy and will be discussed later.

Although the figures are relatively small, they nevertheless warrant the conclusion that about 10 per cent. recurrence was seen in each group. Davey also found a recurrence rate of about 10 per cent. in a group of patients treated in many different ways. The conclusion is justified that a corrective operation in the treatment of recurrent ulceration failed to meet the requirements in 10 per cent. of cases.

TABLE XI

RECURRENCES AFTER SECONDARY OPERATION FOR RECURRENT ULCERATION

	Survivals	*Recurrences*
Gastro-jejunostomy group ..	38	4
Billroth I group	51	4
Billroth II group	85	9
Billroth II group without vagotomy	63	9

In our series of patients, one group was treated by corrective gastrectomy only; in a second group, vagotomy was added to the gastrectomy. Among the patients with recurrent ulceration following Billroth I gastrectomy, there was only one treated by corrective Billroth II gastrectomy with vagotomy. The patients with recurrence following Billroth II gastrectomy include 22 cases in which vagotomy was added. None of the patients who underwent vagotomy in addition to corrective gastrectomy, developed another recurrence. Recurrence was only seen in cases treated by corrective gastrectomy only. These can be divided as follows:

in the gastro-jejunostomy group, 4 recurrences among 38 survivals (10 per cent.);
in the Billroth I group, 4 recurrences among 50 survivals (8 per cent);
in the Billroth II group, 9 recurrences among 63 survivals (15 per cent.).

The last-mentioned group therefore included the most cases of recurrence.

Since the percentage of these recurrences is much larger than that following a well-performed primary Billroth II resection, the question arises as to whether the primary, incorrectly performed, operation may have activated certain factors which promote renewed recurrent ulceration.

In this connection I think it is of importance to draw attention to the fact that, in all cases of repeated recurrent ulceration tested in this respect, free acid values in the gastric juice were found to be considerably too high. Since an ample resection had been made, and since antral mucosa had certainly been removed completely, neurogenic influences seemed a likely cause of the intensive secretion of gastric juice. Under these conditions, vagotomy seemed to be the treatment of choice—a theory which was confirmed by the facts.

I need not dwell upon the problem of vagotomy as a method in the treatment of duodenal ulcer. As recently as 5th November 1959, H. W. Burge delivered an excellent address on his experience with this method before this College (Burge, 1960).

Initially, I have been hesitant to resort to vagotomy in recurrent ulceration. In 1947 and 1948—encouraged by the enthusiasm of Dragstedt—I performed vagotomy with gastro-enterostomy in a small series of cases of duodenal ulcer. The recurrence rate was over 10 per cent.—a fact which I casually mention because the objection might be raised that nerve section could have been incomplete. The Hollander test, however, indicated complete section in all cases. Two of these patients were subsequently seen again, and treated by Billroth II gastrectomy. They have since been completely free of symptoms. Unfortunately, the other four patients refused further treatment.

We have been much impressed by the postoperative intestinal symptoms found in a large percentage of our patients. In some cases these symptoms resulted in a postoperative condition which was less satisfactory than that before the operation. Although I admit that vagotomy has advantages over gastrectomy in terms of mortality, dumping, weight loss and anaemia, the postoperative change in bowel function—not uncommonly associated with pain—was found to be so serious a complication that, also in view of the high recurrence risk, I decided to abandon vagotomy with gastric drainage, and to confine myself to gastrectomy. Burge's exhaustive study has failed to convince me of the desirability of changing my opinion in this respect. To me, a recurrence risk of 3.1 per cent. and 3.8 per cent. in such experienced hands, and 30 per cent. postoperative disturbances in bowel function with 2 to 3 per cent. severe diarrhoea, seems too high a price to pay in exchange for the postoperative difficulties of gastrectomy.

My opinion of this operation is entirely different in cases of recurrent ulceration, because under these conditions vagotomy—performed for the correct indication—has proved to be a particularly useful weapon. Nerve section—carried out in four cases of recurrent ulceration following technically correct Billroth I gastrectomy and in ten cases following technically correct Billroth II gastrectomy—caused prompt disappearance of the ulcer. In 22 patients, corrective gastrectomy according to Billroth II was combined with vagotomy, without a single recurrence.

In view of these excellent results we were tempted to perform the same operation in recurrent ulceration following inadequate gastrectomy. It was carried out in a case of recurrence after insufficient Billroth I gastrectomy with too large a gastric stump; in five cases of recurrence following Billroth II gastrectomy with too large a gastric stump; in the case from the Billroth I group and in one of the five from the Billroth II group, this operation was unsuccessful. The ulcer remained. A later series includes another patient who elsewhere underwent a vagotomy for recurrent ulceration, without success; in this case it was subsequently found that the pylorus and part of the antrum had been left intact. In these three cases, a cure was not attained until after correction of technical imperfections,

although the Hollander test indicated that the nerve section had been complete. From this experience we concluded that, in recurrent ulceration, vagotomy cannot always be expected to yield good results if technical flaws remain uncorrected. The recurrent ulcer, therefore, seems to differ in behaviour from the primary ulcer. After surgical correction of technical imperfections, a cure without recurrence was attained.

The question arises as to whether it is advisable to perform a vagotomy in all cases of recurrent ulceration. I still object to this, for diarrhoea with abdominal symptoms has been seen in eight of the 32 patients, that is in 25 per cent. of cases. In several cases the symptoms were severe. In the large majority of cases, corrective Billroth II gastrectomy as an independent operation yields excellent results; vagotomy is required in only 10 per cent. of patients with recurrence following gastro-jejunostomy or Billroth I gastrectomy and in 15 per cent. of patients with recurrence following Billroth II gastrectomy. In view of these facts it seems unnecessary to add vagotomy, which can give rise to such disagreeable side-effects, to every gastrectomy performed. Meanwhile, it remains difficult to set up rules as to the circumstances in which vagotomy *is* to be performed. The acidity of the gastric juice is our chief yardstick. If the fractional test reveals exceedingly high free acid values, then vagotomy is certainly performed. In recurrent ulceration following Billroth II gastrectomy, our indications have a wider scope than in recurrent ulceration following Billroth I gastrectomy or gastro-jejunostomy.

TABLE XII

GASTRO-JEJUNO-COLIC GROUP	
After gastro-enterostomy	1
After Billroth II	5
TOTAL	6

TABLE XIII

Gastro-jejuno-colic group	6
Diarrhoea	6
Loss of weight	5
Faecal vomiting	5

The gastro-jejuno-colic group

Six patients were treated for gastro-jejuno-colic fistulization (Tables XII and XIII). In one case, fistulization occurred following gastro-enterostomy; in the other five, it occurred after Billroth II gastrectomy. In each of the six cases, gastrectomy with jejunectomy and colectomy was performed without vagotomy. One patient died of shock. In four cases the result was excellent; one patient showed recurrence of gastro-jejuno-colic fistulization, after which he unfortunately died before another surgical intervention was possible. Our impression is, therefore, that there is a severe risk of recurrence in cases of gastro-jejuno-colic

fistulization. At present, I would certainly perform an additional vagotomy in these cases.

Technical considerations

The operative treatment of recurrent ulceration sometimes seems an almost impossible task. The technical difficulties, however, can nearly always be overcome if the various organs are dissected out carefully and anatomically. It is absolutely necessary that the operating surgeon

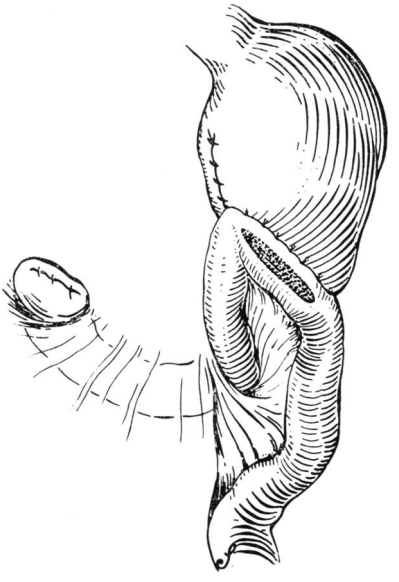

Fig. 3. Hofmeister modification after Billroth II gastrectomy.

attains a good understanding of the anatomical conditions and obtains ample information on the size of the gastric stump, the condition of the duodenal stump after Billroth II gastrectomy, and the condition of the pancreas.

Once decided in favour of Billroth II gastrectomy, it has always been my objective to remove all diseased parts. As a rule, therefore, the stomach was partly removed and, in the case of correction in the gastro-jejunostomy and the Billroth II group, the diseased jejunum was likewise resected. If the afferent loop was long, the new gastro-jejunostomy could be made oral to the entero-anastomosis; in the other cases it had to be localized anal to the anastomosis, and this has never given rise to any difficulty.

If vagotomy is considered necessary, it is desirable that the nerve section be performed prior to the remainder of the operation. The mediastinum is then opened during a still completely aseptic phase of the operation.

For Billroth II gastrectomy we used the Hofmeister modification, making the stoma sufficiently large just to pass the tips of two thumbs. We believe that severe dumping symptoms can be considerably reduced by using this not-too-wide anastomosis.

Results

The outcome of this operative treatment has been evaluated on the basis of the ultimate result; in cases developing a recurrence which was effectively controlled by subsequent treatment, the result last obtained was taken into account.

The result was described as " good " when the patient no longer had any symptoms.

Cases were denoted " improved " when gastric symptoms had disappeared while mild dumping symptoms after ingestion of dairy products and farinaceous foods or a mild change in bowel function persisted.

Results were described as " poor " when the recurrent ulceration persisted, in the case of severe diarrhoea or dumping, and when the patient still had so many complaints that he had not subjectively improved after treatment.

Of the 196 patients who left the department after operation, seven have since died; one died of a recurrent gastro-jejuno-colic ulcer, while the remaining six succumbed to intercurrent diseases.

In the 189 survivals, the results were as follows:

Good-to-excellent	*Improved*	*Poor*
162	16	11 (this category includes three psychiatric patients.)

These findings warrant the conclusion that the surgical treatment of postoperative recurrent ulceration yields good-to-excellent results in more than 85 per cent. of cases, causes considerable improvement in more than 8 per cent., and yields insufficient results in nearly 6 per cent. of cases.

Conclusions

1. If, with Davey, we regard an anastomotic ulcer as a rogue elephant among our peptic ulcer cases, then we would be well-advised to remember

that, in the vast majority of cases, elephants become rogues as a result of maltreatment by man, usually by a poor hit, which maimed rather than killed. In the same way, the rogue among our ulcer cases usually also results from maltreatment of the ulcer. It is as a rule to be ascribed to technically poor operations which, moreover, were often performed at an inauspicious time.

2. Prevention is the treatment of choice for anastomotic ulcers.

3. The surgical treatment of an anastomotic ulcer should be preceded by careful medical treatment, preferably clinical treatment aimed at inactivation of the process.

4. Correction of technical imperfection is a primary necessity in surgical treatment. In our opinion, the Billroth II technique in the Polya-Hofmeister modification is the technique of choice. The diseased jejunum is routinely included in the resection. This operation ensures a definite cure of the ulceration in 90 per cent. of cases.

5. In 10 per cent. of cases this corrective gastrectomy is followed by another recurrence. Under these circumstances vagotomy invariably led to a cure in my series.

6. Vagotomy is no panacea in recurrent ulceration; when technical flaws remained uncorrected, vagotomy repeatedly failed to yield the result desired. Correction of technical imperfections proves to be of paramount importance.

7. Vagotomy, performed for this indication, had disagreeable side-effects, similar to those seen in primary ulcer cases; in our series, this was seen in 25 per cent. of cases.

8. On the basis of this experience, and in view of the fact that vagotomy is unnecessary in 90 per cent. of cases, it seems ill-advised to resort to nerve section in all cases of recurrent ulceration. The selection of cases which require vagotomy is difficult. So far, our yardstick has been the acidity of the gastric juice, and this has been satisfactory. Repeated recurrence of ulceration after these vagotomies has not been observed.

9. In the surgical treatment of recurrent ulceration, vagotomy, performed by the thoracic approach, must only be carried out when it is certain that no technical imperfections exist. Inspection of the stomach and the duodenum stump is generally required.

10. If vagotomy is considered advisable in addition to corrective gastrectomy, then it is advisable to perform the nerve section before the gastrectomy.

REFERENCES

ARMSTRONG, R. A., and PENICK, R. M. (1960) *Ann. Surg.* **152,** 109.
BURGE, H. W. (1960) *Ann. Roy. Coll. Surg. Engl.* **26,** 231.
DAVEY, W. W. (1959) *Ann. Roy. Coll. Surg. Engl.* **24,** 277.
ELLISON, E. H., and ZOLLINGER, R. M. (1950) *Ann. Surg.* **142,** 709.
——————————————— (1956) *Surgery*, **40,** 147.
FINSTERER, H. (1952) *Wien. klin. Wschr.* **102,** 612.
FLÖRCKEN, H., and STEDEN, E. (1926) *Arch. klin. Chir.* **143,** 173.
HUTCHINSON, W. B., and KIRILUK, L. B. (1960) *Amer. J. Surg.* **100,** 251.

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THE EIGHTH INTERNATIONAL CANCER CONGRESS will take place in Moscow from 22nd to 28th July 1962, under the auspices of the International Union Against Cancer. The Congress will meet at the Moscow State University (the new building on Lenin Hills), and will consider both experimental and clinical aspects of the problem.

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