

1932

## Treatment of peptic ulcer from surgical point of view

Serapion B. Ledesma  
*University of Nebraska Medical Center*

This manuscript is historical in nature and may not reflect current medical research and practice. Search [PubMed](#) for current research.

Follow this and additional works at: <https://digitalcommons.unmc.edu/mdtheses>



Part of the [Medical Education Commons](#)

---

### Recommended Citation

Ledesma, Serapion B., "Treatment of peptic ulcer from surgical point of view" (1932). *MD Theses*. 214.  
<https://digitalcommons.unmc.edu/mdtheses/214>

This Thesis is brought to you for free and open access by the Special Collections at DigitalCommons@UNMC. It has been accepted for inclusion in MD Theses by an authorized administrator of DigitalCommons@UNMC. For more information, please contact [digitalcommons@unmc.edu](mailto:digitalcommons@unmc.edu).

SENIOR THESIS

---

---

PEPTIC ULCER

---

TREATMENT OF PEPTIC ULCER FROM SURGICAL  
POINT OF VIEW

---

---

S. B. Ledesma

## P R E F A C E

---

In preparing this Thesis my aim has been to restrict its contents to such a degree as to facilitate the gainful comprehension of the reader. Owing to the limited time of the average person to find out for himself what is for him important and essential amongst the immense mass of modifications, Wolfler, in 1881, at the suggestion of his assistant Nicalodoni, the ideal of Gastric Surgery began. The necessity therefore has arisen for treating the rudiments of Gastric Surgery in a manner especially adapted to the requirements of physiological functions of the stomach. The treatment of peptic ulcer is based on the course of years of experience of trial and error in the European Continent as well as in the New World.

It is the belief of the writer that, in order that struggling young doctor may get the most out of his "day dream" in the realm of Gastric Surgery, his interest must be aroused at the onset. He must be made to perceive that the subject in question has a direct bearing on the problems in which he is interested. Accordingly, a brief

introductory historical account is given, which serves to indicate the importance of physiological constructive Gastric Surgery in order to establish the normal function of the stomach. To this end, the writer when possible has illustrate the principles by drawings taken from the fields of Gastric Surgery, in Journals, and in text books.

S. B. Ledesma

## TABLE OF CONTENTS

---

	Page
I. Introduction	1.
II. Early History	3
III. Incidence	5
IV. Theories of peptic ulcer	6
a. Inflammatory theory	6
b. Neurogenic theory	6
c. Circulatory theory	7
d. Bacteriological theory	8
e. Corrosive theory	8
V. Sequelae and Complications	9
1. Contraction in healing	9
2. Perforation	9
3. Hemorrhage	10
4. Malignant transformation	10
VI. Diagnosis	10
a. Symptoms	11
b. Differential diagnosis	12
VII. Indication for surgical intervention	16
VIII. Types of operation	18
a. Conservative operation	19
b. Radical operation	19
IX. Pre-operative preparation	21
X. Anesthesia used	22

	Page
XI. Partial gastrectomy	25
XII. Segmental resection	26
XIII. Partial gastrectomy Billroth I.method	28
XIV. Sleeve resection	31
XV. Pyloroplasty Finney modification	32
XVI. Gastro-enterostomy	34
XVII. Pyloroplasty vs. gastro-enterostomy	40
XVIII. Pylorotomy	41
XIX. Pyloroplasty - Haberer and Finney mod.	43
XX. Billroth II operation and its mod.	44
XXI. Total and sub-total gastrectomy	46
XXII. Gastro-jejunostomy	48
XXIII. Post operative care	51
XXIV. Résumé	53
XXV. Conclusion	55
XXVI. Bibliography	56

## TREATMENT OF PEPTIC ULCER FROM SURGICAL POINT OF VIEW

S. B. LEDESMA

Originating in the great school of Vienna, fostered in Germany, its progress accelerated by Mayo and Robson, given a classical status by Moynihan, mechanized by Murphy and culminating in the Mayo Clinic, the great field of gastric surgery undergoes trial and error, progress and extension has established, yet in bad risk the mortality is still high.

Surgery of the stomach and duodenum has been developed step by step. Each year has shown some progress, new suggestions; aids to diagnosis; aids to treatment; some have been eliminated, some have been improved. Bold adventures in surgical procedure have recured fresh, unexpected, and even stronger advocacy and support.

One of the questions that interest all medical circles to-day is the treatment of gastric and duodenal ulcer. Purely medical on the one side, conservative or radical surgery on the other, are constantly discussed subjects. All agree on certain absolute indications of surgical interference, such as mechanical obstruction of the pylorus, acute hemorrhage

and perforations. A diverge of opinion is present, however, in the management of chronic callus ulcer. Putting the stomach at rest and controlling the acidity are the subjects of medical treatment. Perhaps in no other field of medicine is there as great a diversity of opinion at the present time as that which exist concerning the proper treatment of lesions of the stomach and duodenum. It offers one of the most frequent topics in the medical journal.

One of the fundamental points all seem to agree that all cases of gastric and duodenal ulcer should be given every possible benefit of medical treatment before surgery is contemplated. This is particularly true of duodenal ulcer in which there is no danger of malignant degeneration and because many duodenal ulcers are undoubtedly cured by proper diet and medical therapy. Because of the danger of malignant degeneration gastric ulcer should come to surgery earlier if medical treatment does not produce results. Of course, if there is any suspicion of cancer no time should be lost in temporizing with medical treatment. So in all duodenal ulcers and most gastric ulcers are given a thorough trial under careful medical care before coming to operation in all the better clinics everywhere. If symptoms persist after medical treatment or if symptoms recur after returning to ordinary life, operation is



indicated.

The picture of abdominal ulcer and perforation into the abdomen was well described in the time of Hypocrates, and under 400 years its management is open to-day to such a divided opinion as was the recent attempt of Ruth Elderly to cross the Atlantic at that time of the year. We have it on authority of the eminent English surgeon, Moynihan, that perforation is the most serious of all complications which can affect a duodenal ulcer. Delay in the diagnosis of appendicitis is regrettable, but does not cause the patient's life; gall-bladder or pyosalpinx is dangerous occurrence but the position may frequently be remedied by a later operation, but in the case of a perforation a delayed diagnosis or an incorrect diagnosis is equivalent to a death sentence with very slight chance of reprieve. Better an early operation by an indifferent surgeon than a late operation by a master.

#### History.

The first history of the pathology of gastric ulcer was published by Baillie in 1793, (2), but inasmuch as it was not accompanied by any clinical data, it had little effect in stimulating interest in the condition.

In 1824, Abercrombie, (1) described much of the symptomatology of gastric ulcer but did not differentiate simple ulcer from ulcerated carcinoma. The credit of

having first recognized the difference between ulcer of the stomach, carcinoma and ordinary gastritis belongs to Cruveilhier, (10) who between 1829 and 1835, published accurate description of the anatomy, the clinical course and the treatment of gastric ulcer. Following this report, Rokitansky, in 1839, described the anatomy of gastric ulcer. Of the enormous numbers of articles published at this time 1885 very few have advanced materially on knowledge of the pathology of the condition of the ulcer. Due largely to their divergence from commonly accepted ideas Wilson and MacCarthy have directed attention to the development of carcinoma in simple ulcers. The theory of bacterial origin has received renewed support from the work of Rosenow. (38). The development of surgical technic has increased greatly, the extent of surgical treatment, and also has been the basis for great amount of work on the experimental production and treatment of this condition.

In 1881, surgical treatment of gastric ulcer and carcinoma began. Prior to this incident, however, following experimental from dogs Giessenbauer and von Winiwater (19) introduced pylorotomy in 1876; Pean, in 1879; and Rydygier, in 1880, (35) . Billroth, (6) in 1881, successfully removed a pyloric carcinoma and sutured remaining portion of the stomach to the duode-

num became known as the Billroth I method. In 1885, Billroth used gastroenterostomy to restore continuity following gastric resection. This became known as Billroth II method. Following this method modifications have been made by numerous surgeons which I shall discuss later on this paper.

In 1886, Heineke, (22) performed a plastic operation on the pylorus. In 1891, Kocher's side to end gastroduodenostomy was reported. In 1892, lateral gastroduodenostomy was suggested of Jabouly (25). In Dr. Welch article in 1885 viewed on the exploration and resection of bleeding ulcers finds many followers to-day, who look upon such a procedure as inferior to the benefit conferred by absolute rest, diet and appropriate medication.

#### Incidence:

Relative frequency of gastric ulcer has usually been estimated from its occurrence as found at autopsy. This method is probably the best at our disposal. In a total of 100,000 autopsies in Europe, the incidence of gastric ulcer was found to be between 4 to 5 per cent. while of 31,815 in America autopsies gastric ulcer was found to be 1.3 per cent. Experience of Mayo, Reed and Einhorn indicates that duodenal ulcer occurs about three times more frequently than does gastric ulcer. Such clinical diagnosis is obviously unreliable but may be of some practical value later on.

Theories:

The theories which have been advanced regarding the clinical cause of peptic ulcer may be classified according to whether or not the initial lesion is regarded as inflammatory, neurogenic, circulatory or bacterial or digestive. The principles embodied in these theories have been claimed to act either independently or in combination in producing the acute ulcer and determining its chronicity. Detail description of these numerous theories is not given her.

Inflammatory theory:

This theory was one of the earliest theories advanced and was influenced by Abercrombie, (37) who believed the presence of inflammatory elsewhere in the stomach. Various degrees of gastritis are frequently found in conjunction with chronic ulcer, but there is no basis for assuming that it may be a cause rather than a secondary result of the presence of ulcer.

Neurogenic theory:

This theory, Rosenow, (39) has had several interpretations. A disturbance of the nerve supply of the stomach has been claimed to account for hypersecretion of gastric juice, hypermotility of the musculature, blood vessel spasm and trophic states, all of which have been associated by different authors, with condition of chronic ulcer. The stomach is innervated both by the vagus nerve and by sympathetic fibers from the celiac

plexus. These nerves approach the stomach through the gastric hepatic omentum, and after penetrating the muscular coats form the myenteric ganglia. Necoloyesen, (29) found these ganglia more profuse in the region of the cardia and near the pylorus. Irritability of the vegetative nervous system has been called upon to explain circulatory disturbance which may be due, as stated above, vessel spasms or to a localized anemia resulting from prolonged muscular constriction.

Circulatory theory:

As a course of simple ulcer, local circulatory disturbance with arrest or impairment of the circulation in a circumscribed part of the stomach wall have been supported by the work of many experiments. Rokitansky(40) and (37), was the first to note hemorrhagic necrosis of gastric mucosa and his observation was followed by Virchow's description of digestion following hemorrhagic infiltration induced by local impairment of circulation. Conditions that may affect the circulation of any part of the stomach will include embolism and thrombosis, atheroma endarteritis obliterans, fatty degeneration, amyloid degeneration, miliary aneurysm and varicoce dilatation, compression and obstruction by spasm of the muscular coats of the muscular wall and vaso constriction of neurologic origin.

Bacteriological theory:

Rosenow, (38) early advocated the theory that stomach ulcers were of infectious origin. The role of bacteria has been considered two-fold, embolic and toxic. The embolic theory leads again to the idea of local circulatory disturbance, which to toxic assumes a specificity against gastric mucosa. Rosenow of the Mayo Clinic in 1916 described an ulcer comparable to man produced by certain strain of streptococcus. Streptococcus has been isolated repeated from various foci of infection in patients with ulcer. He states in conclusion that the small ulcer of the stomach and the duodenum in man is primarily due to a localized hematogenous infection of the mucous membranes by streptococci.

Corrosive theory.

Corrosive theory has long held the attention of surgeons to be the etiological factor of ulcer. It is now generally thought that gastric secretion has little or no part in the initiation of ulceration, but that its digestive action, after injury to the mucosa is an important contribution toward the chronicity of the ulcer. With ordinary injuries, gastric digestion alone is insufficient to prevent healing. Epithelium other than gastric is able to resist this action of hydrochloric acid. This resistance has been attributed

to the presence of musin in the mucous secretion of the pyloric antrum and to the presence of a so called anti-pepsin. Peptic ulcer probably originates from various causes acting upon favorable tissue, that part of the stomach and duodenum supplied by the right gastric and the duodenal artery, with its supraduodenal branch. The initial injury is rendered chronic by the continuous erosive action of the gastric juice, which is aided in its effect by adjacent neuritis, perineuritis and obliterating endarteritis..

#### Sequelae and complications.

The four principal complications of gastric ulcer are contraction in healing, perforation, hemorrhage and malignant change. Cicatricial contraction causes various deformities. Among the more important of these deformities are stenosis of the pylorus with resultant obstruction and dilatation of the stomach; approximation of cardiac and pyloric orifice by the healing of ulcers on the lesser curvature; hour glass stomach produced by the cicatrization of saddle ulcers, and more rarely stenosis of cardiac orifice.

#### Perforation:

As the ulcer extends in depth a circumscribed peritonitis resulting in the formation of adhesion in the surrounding viscera. Perforation into the peritoneal cavity may be permanently or temporarily averted. Should the ulcer perforate before adhesion, the perfo-

ration would of course be directly into the greater or lesser peritoneal cavity.

Hemorrhage:

The source of hemorrhage is from blood vessels either in the stomach wall itself or immediately adjacent to it. Bleeding may also occur from vessels in the parenchyma of organs invaded by the ulcer. Most common source of fatal hemorrhage is from the splenic artery.

Malignant transformation:

First suggested by Cruveilhier, (II) this tendency of gastric ulcers to become cancerous has been commented on repeatedly by pathologists and surgeons since that time. It is considerable importance to the surgeon, inasmuch as his treatment of gastric ulcer must be profoundly influenced by his opinion of the proportion of simple ulcers in which this carcinomatous change may be expected. Cabot and Adie, (13) have recently revived the trend of opinion on this subject from 82 per cent. of gastric ulcers develop carcinoma while 15 authors believe the frequency to be over 50 per cent. In the later case the operating surgeons would tend to be radical in his procedure than that of the former.

Diagnosis:

The most important of the signs and symptoms of gastric ulcer include, hematemesis, melana, abdominal



pain, nausea and vomiting. Altho hematemesis said to be present in only about 50 per cent. of cases, its occurrence is of much value in arriving at the diagnosis. If the bleeding is small, the blood may not be vomited immediately, but may remain in the stomach long enough to assume the characteristic coffee ground appearance. On the other hand vomiting may not occur and the blood will be passed in the stools, giving to the latter its dark color. When the hemorrhage has been profuse it is usually vomited immediately, before the gastric juice has converted hemoglobin to hematin, and it may be bright red in appearance, if arterial or may be composed of large clots. A large hemorrhage occasionally may not be vomited, but may pass through the intestine and produce a tarry stool or more rarely a bloody stool. Such a large concealed hemorrhage may be accompanied by sudden palor, faintness, increased respiration and rapid pulse.

Abdominal pain is often a complaint. It is usually described as boring. In gastric ulcer the pain is usually epigastric just below the ensiform cartilage. It may be intensified by eating or it may reach its maximum and hour later. There may be hyperesthesia and tenderness of the skin, and not infrequently this is present in the back between the 10th thoracic and the first lumbar spine. This abdominal pain often relieved by vomiting may develop immediately on the ingestion of food

altho it may be deferred.

The symptoms of gastric ulcers such as hematemesis, melana, abdominal pain, nausea and vomiting may result from other conditions which are to be differentiated. These conditions include duodenal ulcer, gastric carcinoma, benign tumors, diverticuli, cholecystitis, cholelithiasis, chronic appendicitis, hepatic cirrhosis, splenic anemia, syphilis and functional neurosis.

In duodenal ulcer melana is more common than hematemesis. Pain is usually more variable in intensity and location. It may be located more toward the right side and occur several hours after eating. This is usually designated as hunger pain, and is apparently brought about by the excitability of the stomach due to the presence of an inflammation process. This inflammatory process need not necessarily be located in duodenum or stomach. Chronic cholecystitis and appendicitis are not infrequently a cause. A pain which prompts a man to keep a glass of milk and crackers near his bed is much more liable to be of duodenal than of gastric origin.

With gastric carcinoma, large hematemesis are less frequent than with ulcer. The bleeding come from small oozing ulcerated surface; and usually of the coffee ground variety. Pain is variable in character and intensity. Nausea and vomiting are characteristic. The

amount and character of vomiting depend on the location of the growth. When the obstruction is near the cardia vomiting may be actual regurgitation. Cancer in the body of the stomach symptoms may be very few, and may suggest merely of dyspepsia or gastritis. When the pylorus has been slowly encroached upon the stomach may be markedly dilated, and vomiting occurs only at interval of several days. Vomitus is very foul and nauseating due to fermentation and decomposition. There are other signs equally important; occurs frequently in old age, progressive loss of weight and strength and, in its later stages, fever, cachexia and abdominal tumors.

Benign tumors of the stomach include myomata, fibromata, lipomata, polypoid epithelial growths and endothelioma. The pedunculated tumors and <sup>polyps</sup> polyps when situated near the pylorus may bring about a characteristic valvular form of obstruction.

Diverticuli are more common in the duodenum than in the stomach. This is probably due to the fact that in embryonic life the duodenum may be the source of budding out processes analogous to those outgrowths which give rise to the liver and pancreas. These diverticuli may cause symptoms which may be difficult to differentiate from those gastric ulcer.

Chronic cholecystitis and cholelithiasis, in their

mild stages, may give rise to symptoms which suggest a gastric ulcer. Bleeding is not so frequent and the pain, nausea and vomiting more variable in their character. The pain is more right sided and often radiates to the back.

Chronic appendicitis has given rise to many errors in diagnosis. It is a condition which must always be considered in making the diagnosis of peptic ulcer, since it is the condition most frequently mistaken for both. There may be bleeding, epigastric pain and tenderness, and nausea and vomiting. The pain is often hunger pain in character, due to reflex pylo-spasm, and pressure over the appendix and the gall-bladder should be carefully inspected.

Hepatic cirrhosis and fibrotic splenomegalies are often a cause of hematemesis. By obstruction of the portal circulation varices may develop, which are a frequent cause of bleeding from the mucous membrane or from the larger vessels of the stomach and esophagus.

Syphilis may be present a clinical picture sometimes distinguished with difficulty from that of gastric ulcer. This disease may manifest itself in the gastric crisis of tabes dorsalis, or it may be present in the form of clinical syphilis of the stomach. It is needless to say that a blood Wassermann should be a part of every physical examination when gastric disease is suspected. A

Careful history and physical examination will eliminate most of the conditions which may present the clinical picture of gastric ulcer. Primary anemia with gastric symptoms may not be overlooked. Vomiting and other symptoms referable to the stomach are not uncommon in anemia. If nausea and vomiting arise from this source, it will be found that food is generally well taken after a few days rest in bed.

The stool is examined for occult blood in every case. The examination should be made after a meat free-diet of three days duration and should be repeated several times. The finding of occult blood in the stool signified only that there has been bleeding at some point in the gastro-intestinal tract. If present, the stool should be examined for blood cells, in order that bleeding from the lower rectum or the hemorrhoids may be eliminated. The teeth, gums, and throat should be carefully examined since bleeding from this source may be confusing. Gastric analysis, both of the fasting stomach, and after a test meal are a part of every examination. Increased hydrochloric acid values are common in both gastric and duodenal ulcer, decreased hydrochloric acid or achylia, more frequently in gastric cancer and in anemia. There may be hypersecretion present in chronic appendicitis, chronic cholecystitis and in some functional neuroses.

The roentgen-ray examination contributes much in the diagnosis of gastric disease. It is not infallible and should be considered only as an important link in the chain of evidence on which is based the diagnosis of gastric or duodenal disease.

In conclusion, the diagnosis of gastric and duodenal disease is based on the careful accumulation and interpretation of information derived from many sources. It is only by this thorough examination that patients may be divided into the truly medical or surgical groups and that border-line conditions decrease in number. Most surgeons will feel that the study and diagnosis of non-acute upper abdominal condition is more properly within the province of the practitioner whose interest lies in this direction. Cooperation between the internist and the surgeon is the sine qua non of successful results; and is the means of avoiding those extremes of error, unjustifiable surgery and equally unjustifiable postponed surgery.

Indication for surgical intervention in gastric and duodenal ulcer.

I. Patient who have been treated medically by competent men and who have gone through one or more ulcer cures without becoming free of symptoms should be operated upon.

- 2; Symptoms of pyloric obstruction not relieved by medical management.
3. Repeated hemorrhages, no matter how small, (hematemeses) and occult blood in stools.)
4. Penetrating type of ulcer.
5. Perforation is an absolute indication.
6. In all cases when there is a reasonable ground for suspicion of carcinoma.
7. With troublesome hour-glass stomach.
8. Patients who cannot afford to stay in bed, and the only means of support of himself and family; such patients are confronted by a real economic situation and operation should be seriously considered, especially if conscientious treatment has been tried and has not provided permanent relief.

If we have decided in a given case that surgical treatment should be resorted to, the important question arises which of the many operations that have been devised should be used. Almost all surgeons agree that there is no standard operation that could be employed in every case, and the mode of procedure to be decided upon after the abdomen has been opened and the disease parts have been carefully inspected. A great many methods are at our disposal namely; conservative operations and the

radical operations.

Conservative operations

1. Gastro-enterostomy
2. The different methods of plastic operation
3. The local excision of the ulcer with or without gastro-enterostomy.

Radical operations

1. Resection of the stomach, including resection of the pylorus.

Another classification has been suggested in the surgical treatment of chronic (non-perforated ulcer) under three main heads.

1. Excision
  - a. Simple excision of the ulcer.
  - b. Combined with pyloroplasty.
  - c. Combined with gastro-enterostomy.
2. Gastro-enterostomy
  - a. Gastro-enterostomy alone.
  - b. Combined with excision
  - c. Combined with jejunostomy
3. Resection of a portion of the stomach, intended as Resection of the body (sleeve or segmented resection)
  - b. Partial gastrectomy
  - c. Total gastrectomy

This classification is obviously quite arbitrary



but it forms a good working basis and is readily understood.

For almost forty years gastro-enterostomy was the operation of choice for duodenal ulcer, pyloric ulcer, and for those ulcers at the lesser curvature which were situated in the vicinity of the pylorus whether on the anterior or posterior portion whether penetrating or not. Gastro-enterostomy was devised by Wolfler, (45) at the suggestion of his assistant Nicalodoni, in 1881, as a drainage operation in cases of pyloric obstruction. Depage (14) in Paris 1883, was the first surgeon to use and devise gastro-enterostomy for the cure of pyloric ulcer. Since that time gastro-enterostomy has been the operation for both gastric and duodenal ulcer. In pyloric stenosis due to scar contractions Finney, (16) operation should have been the preference to gastro-enterostomy if the duodenum can be mobilized. In small ulcer in the lesser curvature, cautery excision after Balfour (20) may be practiced.

#### Conservative operation.

As the years passed by it was found by medical men, as well as by the surgeon, that after a certain periods of health these patients again complained of pain, of nausea and hyperacidity. Not infrequently jejunal ulcers developed at the sight of anastomosis. These failures of the conservative operations to cure

permanently have been prompted many surgeons of large experience to turn to the radical operation namely, resection of the ulcer bearing portion of the stomach. Several methods are at our disposal to restore the continuity of the alimentary track after resection of the stomach namely; end to end anastomosis of stomach and duodenum according to Billroth I method or the posterior gastro-enterostomy with rest of the stomach, Billroth II method. There are inexistence to-day a number of modifications of the Billroth method II.

In the choice of operation the surgeon must be wholly influence by the condition of his patient and should be guided directly by the condition found in the individual case. The operative procedure selected will then be determined by the surgeon's opinion regarding the following important consideration; (1) the important of removal of the ulcer bearing area of the stomach; (2) the efficacy of the reduction of gastric acidity by a large resection; and (3) the possibility of subsequent carcinomatous transformation.

Moynihan (28) in his Huntarian lecture states that the mortality is higher with medical than with surgical treatment, taking into account the results of perforation and hemorrhage while under treatment. Investigation has shown that medical treatment of ulcer is attended by just as grave risk as is surgical treatment, and,

unless instituted very early, is not likely to bring about radical cure. Failure of medical treatment, surgical operation must be instituted.

#### Disadvantages of medical treatment.

Medical treatment is dangerous, prolonged, and it looks as a very tedious business. Our object is not temporary to abolish the symptoms but to secure the firm ~~bleeding~~<sup>healing</sup> of the ulcer. Medical treatment of the past has failed very badly. It fails far to often today. The ambulatory and perfunctory treatment of gastric and duodenal ulcers by triple carbonates and adequate dietary restriction has added much to surgical anxiety and unhappy experience.

#### Pre-operative preparation.

Previous to all surgical operations upon the stomach there should always be a period of preliminary preparations, unless it is an emergency. For several days previous to the operation the patient is instructed to brush his teeth, and rinse the mouth with one per cent carbolic acid solution several times a day. Food is scrupulously watch, nothing but sterile cooked food. If there is gastric stasis present, lavage once or twice a day should be employed. Cushing and Levingood (9) have been convinced that acid stomach will sterilized itself in approximately forty eight hours, if no infectious material is igested with the food. However,

this rule does not apply in the case of ulcerating carcinoma of the stomach walls.

The routine comprehensive physical examinations of the patient demanded by good surgery should never be omitted, except in case of dire emergency. Force fluids transfusion indicated with hemoglobin under sixty.

Anesthesia used.

In the choice of anesthesia due consideration should be given to the claim of local as against general methods. Regional anesthesia is becoming more and more practiced as our knowledge increases. The administration of a general anesthesia should always be in the hands of the most competent anesthetist available. The fundamental rules of good surgery, meticulous attention to details, complete asepsis, gentle handling of tissues absolute hemostasis, and avoidance of undue haste, should govern the surgeon's very action. When scrupulously observed they to a marked degree, favorably influence the ultimate results.

Bastianelli in Rome, Italy, and Finsterer in Vienna, do almost all of them while doing stomach and duodenal surgery employ local and splanchnic anesthesia. It is not a perfect anesthesia by any means and the patient do suffer considerable pain. However, both these men claim that they have reduced their operation mortality by half

since adopting this method and stopping the use of ether and chloroform entirely.

H.P. Brown (?) uses nitrous oxide and oxygen as anesthesia as a choice unless the surgeon has a strong preference for some form of local anesthesia in perforation.

#### The treatment of acute crisis. (Hemorrhage)

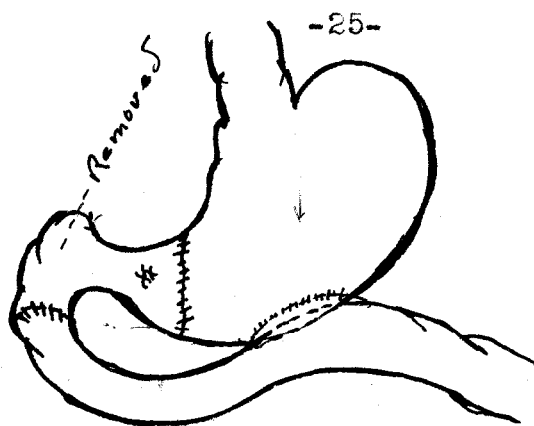
The complicating gastric ulcer which have the greatest effect in bringing about an acute emergency are perforation and hemorrhage. Most surgeons rarely felt that operative intervention was indicated in hemorrhage from gastric ulcer. The treatment of choice is the physiological rest. Absolute rest in bed, sufficient porphia to insure gastro-intestinal quiet, nothing by mouth, normal salt solution administered by hypodermoclysis, glucose and soda by proctoclysis, and ice-bag to epigastrium constitute the routine treatment. Blood pressure must be watched carefully. If transfusions are used, the amount in any single administration should not exceed 250 cc. The ordinary 500 cc. may increase the B.P. and organized blood clot may be discharged. In some cases thromboplastin and horse serum may be used to distinct benefit. In severe hemorrhage surgery is resorted to only when the hemorrhage is repeated or after recovery from it to prevent further bleeding.

#### Perforations.

Of all the catastrophies that require the help of the surgeon few are more urgently insistent in their

demands upon his resources than is a perforated gastric ulcer. Not only is the life of the patient seriously jeopardized by the rapidly ensuing peritonitis, but the frequency accompanying shock and agonizing pain demands the earliest possible relief. The most characteristic feature of acute perforation of gastric ulcer is a sudden unheralded pain in the epigastrium quite an extreme severity. Patient lies in one position not daring to move; his body tense and rigid, abdomen sensitive especially over the perforation. As soon as diagnosis is made, it is safer to open the abdomen immediately, while patient is still in good condition. When in doubt, operate as this often the more conservative course of treatment.

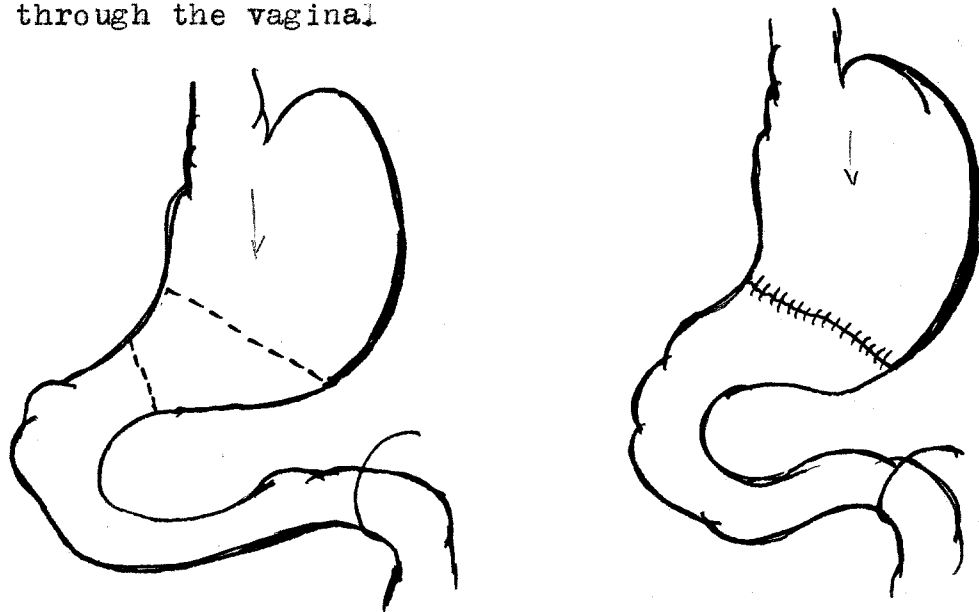
If the ulcer happens to be situated on the anterior wall near the pylorus, the operation of choice is pyloroplasty so modified as to include the ulcer together with its perforation between the anterior and posterior suture lines, thereby excising the whole area. However, when the perforation occurs along the lesser curvature as it more often the case, the choice of operation lies between (1) suture of the operation, (2) future of the perforation together with posterior gastro-enterostomy.



Partial gastrectomy followed by one of the usual methods of gastro-enterostomy.

In opening the abdomen every precaution should be taken to combat the shock and collapse as a result of perforation. The high rectus incision is the incision of choice. As soon as it has been found, that part of the stomach should be gently drawn up into the wound, and isolated from the rest of the abdominal cavity by gauze pads with warm salts solution. The surgeon's problem is to apply to this particular case that particular form of operative procedure which in his judgement is most suitable to the condition present. Where the edges of the ulcer and adjacent walls of the intestine are found to be rigid and indurated owing to edema and round cell infiltration, the interrupted mattress suture of Halsted, Harbere and Finney (24), has been found most satisfactory as it includes a better bite of tissues than other types and secures better inversion. It is

always well to reinforce the suture line with omentum or with other adjacent and available tissues. Before closing the abdomen it is a good practice to turn the omentum upward under the lower and between the stomach and the anterior abdominal wall, relying on it to reinforce the suture line still further and to limit the area of possible infection. The question of drainage is a debatable one. Some authentic advise drainage as a routine practice and other are opposed to it. The latter is the better. In case of peritonitis it is a good rule to drain. Multiple drainage are necessary and cigaret drainage is preferred. In men these drainage are placed independent portions and brought out through atab wounds in the flanks about the pubes, or in the case of women through the vaginal.

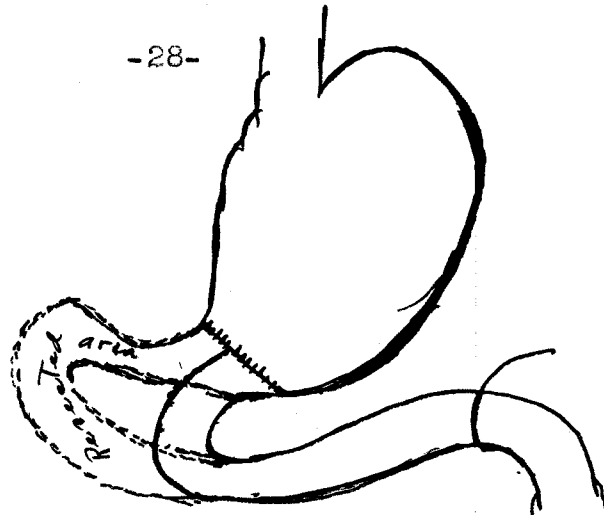


Segmental resection. Left. lines of incision.  
Right. Operation completed.



When the ulcer is located at the pylorus or in the pyloric portion of the anterior wall, a pyloroplasty presents the advantages of excision of the ulcer, with a reconstruction of the pyloric orifice in such a way that the possibility of stenosis is entirely eliminated. If pyloroplasty operation is not used the opinion of choice is gastro-enterostomy with or without excision of the ulcer or the more radical procedure, partial gastrectomy with restoration by one of the modifications of the Billroth I or II method, by Rodman (42).

If local excision of a pyloric ulcer is performed obliteration of the pyloric orifice may follow, and unless combined pyloroplasty,  $\frac{1}{2}$  gastro-enterostomy must be performed. Gastro-enterostomy with a nearly obstructed pylorus will, as a rule, be more efficient and give better clinical results than one performed in the presence of a patent pylorus. If the ulcer is not excised good results may be followed by gastro-enterostomy.



Partial Gastrectomy- Billroth I method modification.

In the radical partial gastrectomy for the pyloric ulcer has been advised by Rodman (42) because it removes the ulcer bearing area of the stomach. That gastric resection is diminished by the removal of a large portion. Ulcer of the lesser curvature simple gastro-enterostomy, or pyloroplasty may be performed or may be combined with local excision of the ulcer, which in this region may be carried out with a wedge or V shape resection.

J. Finney (17) more often does a partial gastric resection. The method of anastomosis of choice with him is entire end of the stomach, with the side of the duodenum if this is not impossible; a gastro-enterostomy leaving a blind pouch of the duodenum after the second method of Billroth.

The late C. Peck (35) of New York, did a partial gastrectomy in large indurated ulcer but did not do so as large resections as many other surgeons advocate.

At the Mayo Clinic (32) resection of the acid bearing part of the ulcer is of any size is constantly being removed.

T. Burges (5) of Boston advocates a combination of cautery punch and gastro-enterostomy in ulcer of the lesser curvature of the stomach with reduced mortality than partial gastric resection.

In vonEiselsberg's (48) clinic in Vienna a partial<sup>v</sup> gastrectomy is almost always done for gastric ulcer. In fact apparently gastro-enterostomy is never used, except in a quick way of relieving obstruction in otherwise inoperable cases.

Dr. Bastianelli of Rome, Italy , does partial gastrectomy for practically all cases of of gastric ulcer. In his experience he had had a high per cent. of recurrence of gastro-jejunal ulcers.

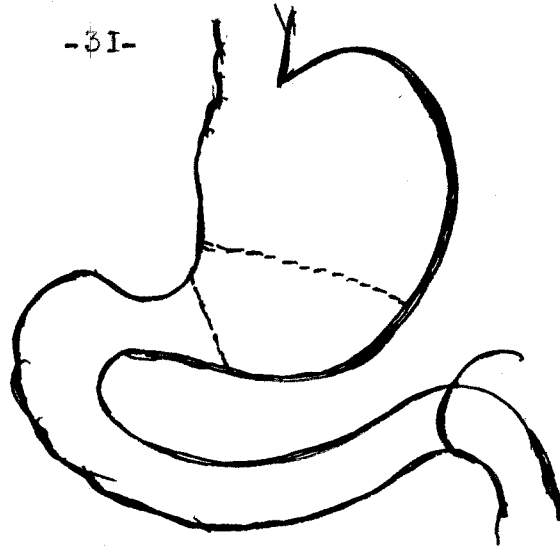
Partial gastrectomy, if the patients condition permits, offers the best chance of complete cure without later complication at least as far as present available statistic show. Finisterer and von Eiselsberg in Vienna both used partial gastrectomy with the removal of the acid bearing part of the stomach is almost always done. It is claimed, that Herman Fisher's experience in partial gastrectomy gave him the best results and the reports of other surgeons, in Europe and in America, with larger

mortality of gastric resection is about 5 to 7 per cent. the immediate mortality of gastro-enterostomy from hemorrhage after operation and from perforation which is as 5 to 15 per cent. and so after all is said and done, the total mortality after resection is much smaller in comparison and the end results infinitely better.

Radical partial gastrectomy for pyloric ulcer has many advocates. The argument in favor of this procedure are that it removes the ulcer bearing area of the stomach, Rodman, and that the gastric secretion is diminished by the removal of a large portion of normal gastric mucosa.

Galpin(20) says he has come back to gastro-enterostomy after giving it up for gastrectomy as the former was safer and the results satisfactory. The field for partial gastrectomy is much wider in cases of gastric ulcer than in cases of duodenal ulcer. For extensive ulcerations in the vicinity of the pylorus the partial gastrectomy of (Rodman) or (Billroth) has held steady place in the esteem of conservative surgeon.

-31-



### Sleeve or segmented resections

Sleeve or segmented resections have been used occasionally to advantage. Ulcers higher on the lesser curvature are perhaps better treated by the more radical partial gastrectomies. Ulcers elsewhere than at the pylorus or on the lesser curvature may often be treated by simple excision without the pressing necessity of gastro-enterostomy or pyloroplasty. Sleeve resections offer some possibilities, but here partial gastrectomy followed by von Haberer and Finney's (23) modifications of the Billroth I resection, or by one of the modifications of the Billroth II. If, however, the ulcer has become adherent to the pancreas, liver, or less rarely to the spleen, it may be excised and the base simply cauterized and left in place, and the stomach restored as above. Drainage to this area is usually advisable.

A. J. Walton (47) of London is a strong advocates of segmented resection of ulcer of the body of stomach. A gastro-enterostomy is performed at the same time. He also closes the pylorus with one silk string stitch expecting to reopen in a few months. He reserves gastrectomy for those cases in which segmented resection would be different or impossible and for large ulcer near the pylorus which are suggestive of cancer. Resection of the ulcer is unquestionably more logical and gives much better promise of permanent relief and satisfactory results.

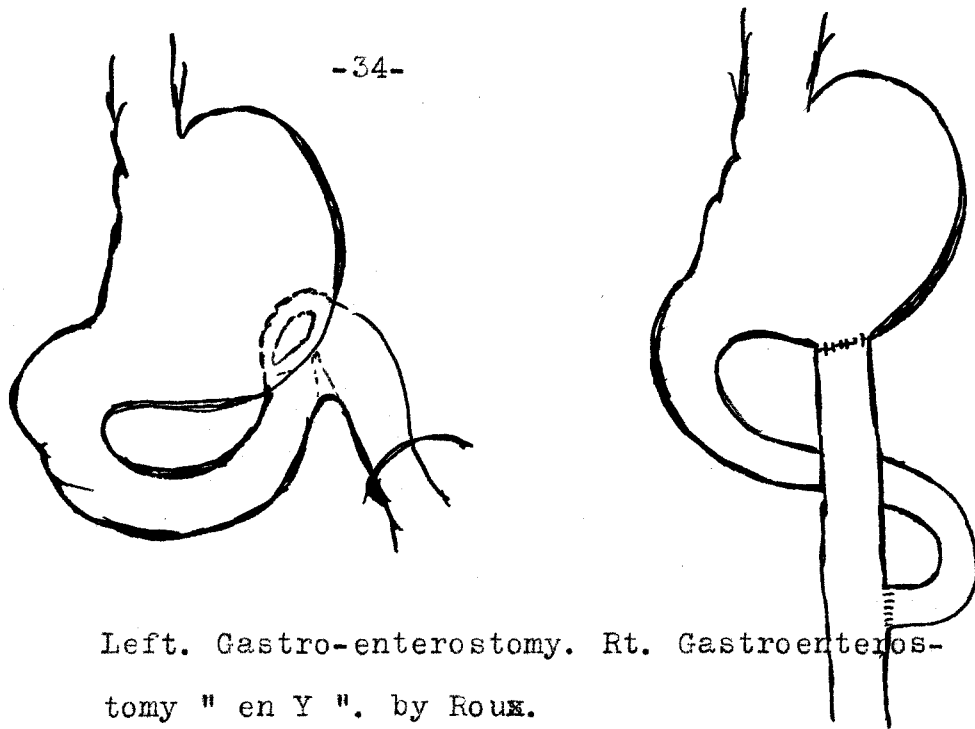


Pyloroplasty. Finney, with excision of an ulcer on the anterior wall of the stomach. Rt. pyloroplasty completed.

A pyloroplasty on the pylorus was first performed by Heineke in 1886 (2) followed independently by Mikulicz in 1887. Kocher's (26) end to side gastro-duodenos-

tomy following pylorotomy was reported in 1891. Lateral gastro-duodenostomy was suggested by Jabouly in 1892. and the first report of its clinical application was made by Henly in 1898. This operation was the precursor of the method of pyloro-duodenostomy which was reported in 1902 by von Haberer, and 1924 by Finney working independently, reported modified Billroth I. to end to side gastro-duodenostomy. Ulcer near pylorus located anteriorly, pyloroplasty is indicated with gastro-enterostomy with a line of supporters namely; Finney, Heineke, Mikulicz, and C. H. Mayo. If pyloroplasty is not used, gastro-enterostomy with or without excision of the ulcer or the more radical procedure, partial gastrectomy with restoration by one of the modification of the Billroth I or II operation.

Much of the criticisms which has been directed toward this procedure has been due to the fact that the operation has sometimes been pushed beyond its limitations, or performed spite of definite contraindications. Briefly, the chief indications for pyloroplasty are; 1. benign stricture from any cause at or near the pylorus; 2. the excision of ulcers, gastro or duodenal in the same location. The chief contra-indications are: 1. the presence of malignancy, 2. the inability of surgeon to mobilized the duodenum satisfactory.



Left. Gastro-enterostomy. Rt. Gastroenterostomy " en Y ". by Roux.

#### Gastro-enterostomy.

This important operation was first performed in 1881, by Wolfler, (46) at the suggestion of his assistant Nicalodoni, in Billroth's clinic. The anastomosis was made between the stomach, a finger breath above the insertion of the gastro-colic ligament and a loop of small intestine. In 1883, Couvoisier advocated making the the anastomosis retro-colic and with either the duodenum jejunal flexure or the first portion of the jejunum. In 1885, von Hacker (49) perfected the method of making the opening in the transverse mesocolon so that the danger to the circulation of the transvers colon is minimized. To prevent regurgitation, the duodenal content, Kocker made the incision perpendicular to the long axis and curved so as to form a valve-like opening.



Brown and Jabouly conceive the idea that afferent and efferent loops of the intestines as valuable adjunct. The object of this procedure was to regulate the condition of poor circulation in the loops of intestine sutured together in such a way that outflow of the contents of the stomach and intestine is assured. Posterior gastro-enterostomy was improved by von Hacker in 1885, Czerny in 1890, and the later brought to its present form by the Mayo's and Moynihan.

Recent development and statistics.

J. T. Finney of Baltimore says that gastro-enterostomy has a definite role in a complete obstruction of the pylorus, but not in any form of gastric ulcer. The late C. Peck of New York, frequently did a gastro-enterostomy and nothing else in the ulcer was small and not indurated.

Gastro-enterostomy frequently is followed by gastro-jejunal ulcer. It is especially important that the jejunal loop should lie in correct position to the posterior wall of the stomach, the afferent portion which is fixed to the ligament of Trietz must be in the lesser curvature and the efferent portion which is mobile, on the greater curvature. The loop should not be taken too short nor too long or the efferent portion may be sag and favor retrograde position. To prevent the sagging of the mesocolon interrupted sutures are made to the

peritoneum of the pancreas and the base of the mesocolon.

The method employed of excision gastro-enterostomy stomata with marginal ulcers, together with method of closing the jejunum is described and illustrated. That gastro-enterostomy cures a much smaller percentage of gastric ulcer than it does of duodenal ulcer, is, I believe the general accepted position of American surgeons. Balfour (39) reports of 1000 cases of gastro-enterostomy with an incidence of 2 per cent. Berg reports an incidence of 12.5 per cent. Finsterer and Panchet and other continental surgeons have reported higher incidence than the average given in American clinic.

F. B. Lund, (27) of Boston, does gastro-enterostomy except in bleeding ulcers when excision or resection is done. It has been claimed by some writer notably Paterson, that the good effects of gastro-enterostomy are due to the clinical changes in the gastric secretions, that there is lessened hyperacidity, due to the presence of bile and pancreatic juice in the stomach. It is probable that the drainage factor and the clinical changes are responsible for the cures of gastric and duodenal ulcers after gastrectomy.

Here are figures, Takat's G.de (44) of gastric operations of the first surgical clinic, University of Budapest 1924.

Gastro and duodenal ulcers -----	841
Carcinoma -----	401
Sarcoma -----	1
Fibromyoma -----	2

Operations	NO.	Mortality.
Pylorectomy excision von Eiselsberg-	85	3.5%
Excision, longitudinal severe	41	3.7%
Gastro-enterostomy-----	274	5.8%
Radical resection -----	222	5.4%
Secondary resection for recurrence -	20	7.3%

Lowering of Acidity.

Number of cases.	Types of operation	before	after.
200	-----Anastomosis-	F.H. 24	F.H. 23
200		T.A. 53	T.A. 46
200	-----	F.H. 30	F.H. 3
		T.A. 26	T.A. 15.

Gastric surgery is still in its evolution. We seem to have swing back to the time Billroth in 1881 first advised a radical resection. At the present time on the basis of the statistics above, in cases of unsuccessful medical treatment a radical procedure for gastrœ enterostomy seems advisable.

W.J.Mayo (33) states that gastro-enterostomy cures over 90 per cent of duodenal ulcers, and Peck that of

90.8 per cent of patient were permanently relieved and free from gastric symptoms after gastro-enterostomy properly performed. Not all continental surgeons find that gastro-enterostomy fails to give satisfactory results. This Mayo says, in about 50 per cent. of patient who fails to have satisfactory relief the difficulty is functional and can be relieved by medical treatment. Jejunal ulcer, the most serious sequelae of gastro-enterostomy has brought the most criticism. The cause is unknown. Judd of the Mayo Clinic says, that it is due to unabsorbable sutures were found in 26 per cent of IOI cases operated at the Mayo Clinic.

Disadvantages of gastro-enterostomy.

1. Fails to cure duodenal ulcers in a large number of instances.
2. Local excision of a duodenal ulcer, followed by gastro-enterostomy applicable only when the ulcer is anterior.
3. Gastro-enterostomy is not a choice for healed duodenal ulcer.
4. Gastro-enterostomy followed by gastro-jejunal ulcer is considerable magnitude and of grave risk to the patient.
5. Gastro-enterostomy does not safeguard the patient against subsequent hemorrhage from duodenal ulcer.

6. Gastro-enterostomy does not produce a marked reduction in gastric hyperacidity.

What then does gastro-enterostomy do? What can we expect to gain by the operation?

- a. In the first place it reduces the emptying time to nearly normal time.
- b. It relieves nausea and vomiting and visible peristalsis.
- c. It relieves the pain while relief of pain does not prove that the ulcer is well healed, the annoying clinical symptoms disappear.
- d. It does materially aid in healing of a duodenal ulcer, prevent continued secretion, and lessens the the hypermobility.
- e. Gastro-enterostomy reduces intragastric tension.

It might be said that gastro-enterostomy combined with jejunostomy is a rare operation. Its indication appears to be limited for cases of large chronic gastric ulcer near the cardiac orifice surrounded by inflammatory tissue, and adherent to the pancreas or liver. Technic may be found in the practice of surgery Dean Lewis Vol VI. Page 64.

Résumé:

Gastro-enterotomy even with its uncertainty

incidence of gastrojejunal ulcer, may be preferable in certain cases where medical measures have been exhausted, to partial gastrectomy with its high mortality. However, at the present status of surgical intervention of peptic ulcer, continental surgeons as well as American surgeons partial gastrectomy seems to gain recognition more and more support than gastro-enterostomy. Gastro-enterostomy opening to secure the maximum amount of drainage must be of ample size and place as near the pylorus as possible preferably in the antrum pylori. The serious distention in the jejunum does not occur after gastro-enterostomy; the food is seen to pass rapidly through the many loops of the small intestine before it finally stops.

#### Pyloroplasty vs. gastro-enterostomy.

Pyloroplasty well done usually eliminate the possibility of pyloric stenosis by the abolition of the pyloric ring. These ramins no sphincteric action and the size of the opening from the stomach is limited only by the diameter of the duodenum. Following this operation, gastric acidity is reduced by the regurgitation of bile and pancreatic juice and the abolition of pyloric stenosis. Within two months after the operation the abdominal content remain norma.

Gastro-enterostomy is not a drainage proposition but a reduction of gastric acidity. Schuller (43) showed that in the presence of a patent pylorus the peristaltic wave is unchanged after gastro-enterostomy and that the food passes in equal parts through the pylorus and the stoma. Numerous workers agree that as long as the pylorus is patent, gastro-enterostomy is not an ideal operation. In pyloroplasty these objections according to Cannon are avoided. Too rapid exit of food through the pylorus is prevented by rhythmic segmentation of food in the duodenum, an activity which in part replaces the function of the pylorus and also mixed food with pancreatic juice and bile.

In addition to its unphysiological aspects, gastro-enterostomy may be attended by the none too rare complications of gastro-jejunal ulceration. It is on the basis of a comparison following pyloroplasty with those following gastro-enterostomy that reconstruction following partial gastrectomy, termino-lateral Billroth (I) be used rather than Billroth II or its modifications.

The dangers following Billroth II may be avoided by Billroth I. by the direct union of the remaining portion of the stomach to the duodenum. Haberer in 1922 and Finney in 1923 (18) found that an end to side gastroduodenostomy could be performed in nearly all cases of extension resection.

In résumé, it must be remembered that an operation should attempt to force the performance of any particular type of operation in dealing with peptic ulcer. Perforated ulcer should be closed or excised. When located at the pylorus or anterior wall near the pylorus excision may be combined with pyloroplasty or gastro-enterostomy is recommended when patency of the pylorus is endangered. Perforations away from pylorus should be excised or closed, or partial gastrectomy may be resorted to rather than gastro-enterostomy. In dealing with chronic ulcers operated upon in quiescent stage, pyloroplasty with excision is preferred or partial gastrectomy followed by Haberer and Finney's modifications of Billroth I operation.



Pylorotomy

Following experiments in dogs, Geissenbauer and von Winiwater in 1786, proposed pylorotomy.

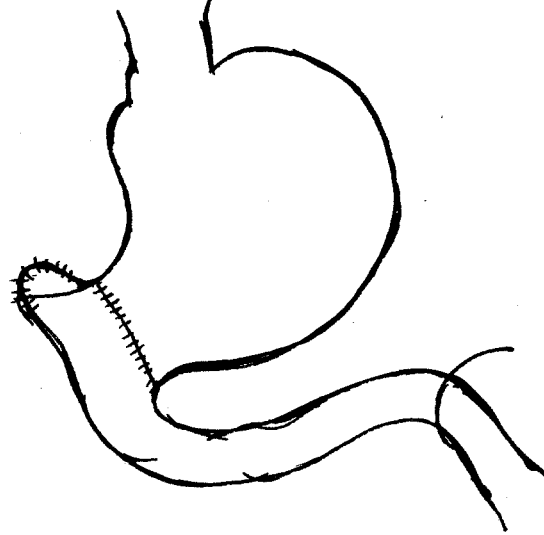


The earliest record on this was published in 1810, by Merren Geissen in a monograph the extirpation of the pylorus. Pean in 1879, and Rydygier in 1880, had successfully attempted the operation on human subjects. Billroth in 1881, successfully removed a pyloric carcinoma end to end suture of duodenum and stomach so called Billroth I method. In 1885, he used gastrojejunostomy so called Billroth II method. von Hacker while describing this procedure jejunostomy, Krolein subsequently performed the operation. To this operation with slight modification, the following names von Hacker, Krolein, Mikulicz, von Eiselsberg, Hoffmeister, Reichel and Poyla have been attached.

Here we are interested primarily of the anastomosis after the diseased portion of the duodenum has been removed. The proximal end of the duodenum was sutured to the distal end of the stomach as shown in the diagram.

In 1893, Kocher (26) dissatisfied of the result of the result of Billroth I, he closed the distal end of the stomach and the duodenum was implanted into a new gastric incision. His objections of the Billroth I were based on the difficulty encountered in suturing satisfactorily the end of the duodenum in the reduced opening of the stomach. Finally an incision is made in the posterior wall of the stomach the size of the duodenum and complete anastomosis is made, and this constitute

the Kocher's modification of Billroth I.



Haberer and Finney modification.

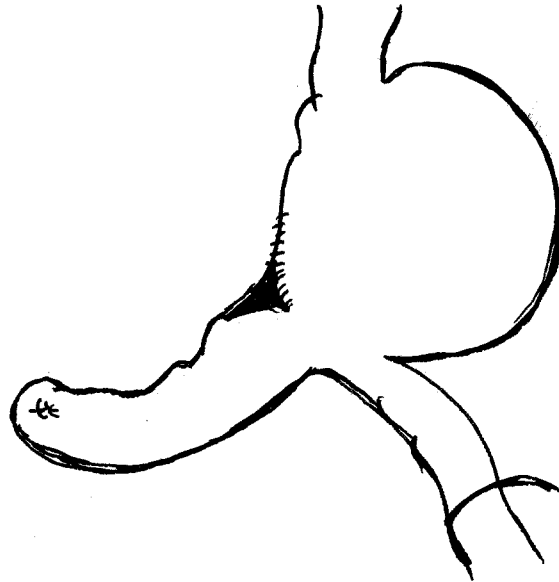
This procedure has been the logical and inevitable out growth of the pyloroplasty operation. It represents an attempt to excise the more inaccessible ulcers in the vicinity of the pylorus particularly those located posteriorly, and to restore continuity by a form of gastro-duodenal anastomosis which embodies the best features of the pyloroplasty. In this procedure the pyloric end of the stomach is resected in the usual fashion. The stomach is mobilized in the manner suggested by W.J. Mayo, and the duodenum is mobilized in the same manner. Duodenal end is closed by whatever method is preferred. Now the orifice of the mobilized stomach may be sutured to the side of the duodenum in exactly the same manner in which a termino-lateral gastro-jejunal anastomosis is made. The closed end of the duodenum lies just above the

lesser curvature.

Advantages of the operation.

- a. Gastric contents are received into the duodenum.
- b. No danger of retrograde filling of a closed duodenal loop.
- c. The transverse mesocolon is not interfered with.

The success of the operation depends wholly upon the satisfactory mobilization of the duodenum. If this mobilization is complete, suture strain with its disastrous consequences is inevitable.



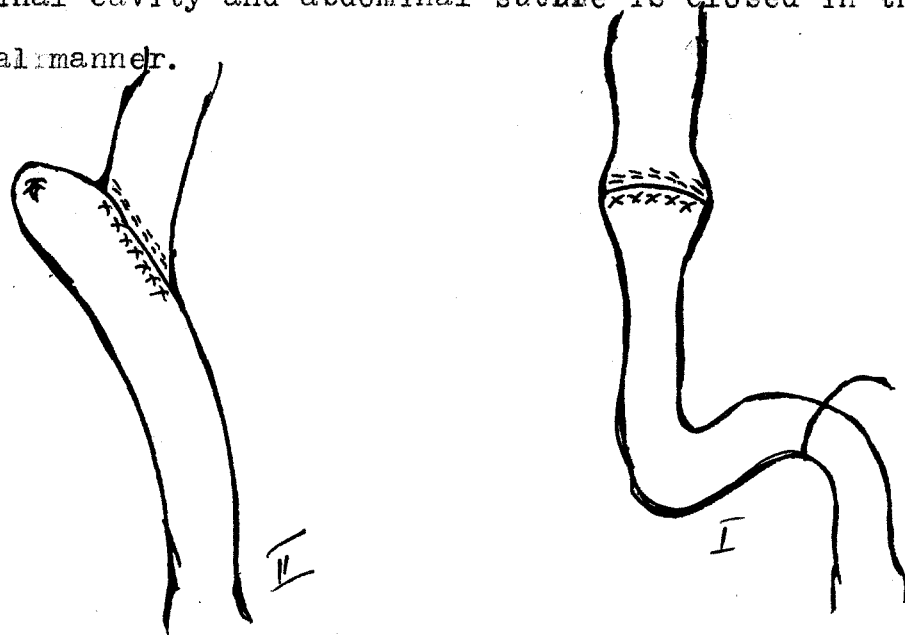
Billroth II operation and its modification. In 1885, von Hacker reported and published in the same year this method of operation. At first it was found

that gastro-enterostomy has to be performed according to Wolfler's method. A portion of the duodenum was removed and closed by inverting the duodenal end to its lumen and closed with Lambert's sutures in two rows. In 1887, Krolein apparently utilized the end to side gastro-enterostomy first made by Hacker. The following year 1888, von Eiselsberg has recognized the worth of this modification that is, the gastric amputation is parallel to the long axis of the body, with partial occlusion of the open end, and jejunal union with remaining portion on the side toward the greater curvature.

The von Eiselsberg, Hoffmeister- Finsterer's modification.

The transverse colon is delivered out of the abdominal cavity. The first loop of the jejunum which is found to the left of the spinal column at the base of the transverse mesocolon is marked with a fixation suture. Then a slit is made in the mesocolon from the base up to the vascular arch, for a distance of about ten centimeters. The edges of this slit are also fixed with silk sutures. Then the duodenum is crushed and cut and closed with the usual fashion. Now the first loop of the jejunum is now drawn through the opening in the mesocolon and the loop so applied to the stomach

opening makes the afferent loop lie toward the lesser curvature. After the anastomosis is completed, the remaining portion of the stomach is returned to the abdominal cavity and abdominal suture is closed in the usual manner.



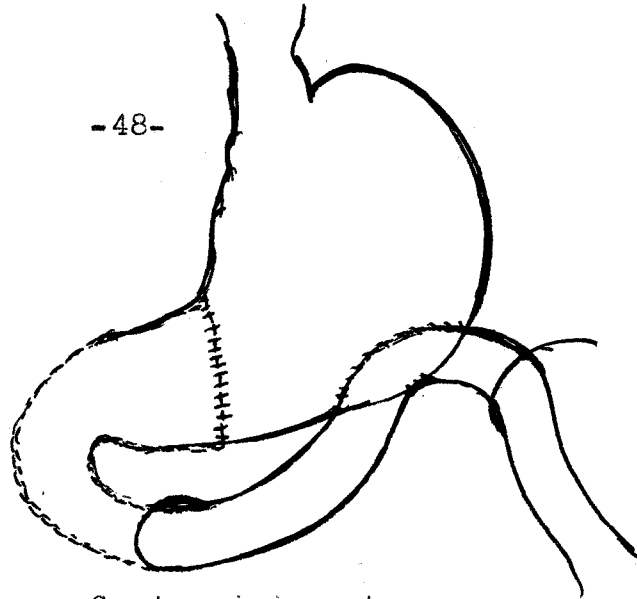
Total and subtotal gastrectomy

In 1810, Merren (34) stated that the suggestion of gastrectomy was first made by an American, highly renowned among the medical profession of Philadelphia. Unquestionably this refers to John Jones, first professor of Surgery in Kings College in New York, the forerunner of Columbia. Merren also was a pioneer in this field of surgery in his advocacy of gastrectomy.

In 1876, Geissenbauer and von Winiwater had performed partial gastrectomy in dogs and reported that they live indefinitely after removal of considerable portions. Upon this experimental work on animals was based

upon the successful partial resection of the stomach which Billroth first performed in 1881.

In the United States, gastric surgery developed very rapidly, Connor of Cincinnati, in 1894, reported the first total resection in man. Unfortunately the man died. However, in 1897, Schlatter reported the first successful results of the operation. From this time on a number of cases were reported definitely established the position of this operation in surgery. It is noteworthy fact that out of 110 cases reported sixty six cases recovered from immediate effects of the operation and lived for a longer or shorter period. One of these patients lived for six years after a subtotal resection for carcinoma. Those who live in comparatively short time after operation were stated to be due to shock, exhaustion, inanition, cardiac failure, post operative pneumonia, infection, etc. Autopsy report, in 25 cases, showed that peritonitis plays an important role in bringing about post operative death.



Gastro-jejunostomy

There is probably no operation in surgery which has added more to the sum of human happiness than gastro-jejunostomy. Nevertheless every new discovery and improvement has some attendant drawbacks.

The jejunal loop, the most important mechanical problems are the length of the jejunal loop and its direction. If the loop is too short there will be intermittent of the jejunal content which at times will accumulate in the stomach. If the loop is too long a vicious circle may be established.

Some operators were making a gastro-jejunal anti colic long loop anastomosis; while some made it retro-colic with no loop. Some combined jejuno-jejunal anastomosis with a gastro-jejunal implantation. Balfour (3) and Moynihan well state that with the enormous number of gastrojejunostomy performed there are bound to be a small number unsuccessful, which gives undue publicity one of the most useful of all surgical procedures. It is

an operation which has removed nothing, having added a new function, which cannot, as with all forms of therapy, expect to be successful to a degree approximately a 100 per cent.

Without reiterating what has been said before of the duodenal ulcer, it is interesting to note the direction in which surgery of peptic ulcer is headed to. Austria and Germany resection of duodenal ulcer is commonly practiced. Duodenal ulcers may be divided into certain groups which offer varying indications for treatment. Small single ulcer of the anterior wall, not involving the pylorus or narrowing the lumen; these may be treated with excision, even without gastro-enterostomy; or pyloroplasty with excision. This group is relatively small one.

Chronic indurated ulcer, with or without penetration or fixation of the duodenum, but without obstruction or hemorrhage, comprise the great majority for this group, at least as the primary one.

The third consists of large standing, where there is pyloric stenosis, causing delayed emptying and dilatation of the stomach. Gastro-enterostomy is very successful in these cases is generally conceded.

Finney (24) of Johns Hopkins uses the pyloroplasty that he devised in great many cases, probably 75 per cent



of all duodenal ulcers.

With large indurated ulcer and when duodenum cannot be mobilized for a pyloroplasty, he often does a pylorectomy and then re-unites the end of the stomach to the side of the duodenum after the method described of Finney and Harberer. In cases where either pyloroplasty or pylorotomy would be difficult or dangerous, he does a posterior gastro-enterostomy.

Dr. I. Endman (15) of New York, at present is doing pyloroplasty as described by Horsley with very gratifying results. The Mayo Clinic has long been the out standing exponent of gastro-enterostomy in the treatment of duodenal ulcer. Recently, however, they have been using pyloroplasty or pylorotomy with gratifying results. Duodenal tubes has been recommended in handling of difficult cases. Intruduce the tube before operation and just before closing, the tube is carried several inches down the small intestine well past the sight of anastomosis. This is a valuable procedure for two reasons; first tube feeding may be instituted immediately; and second, it is quite possible that kinking is avoided.

Post operative care

---

Post operative care of these patient is the out most important. It consists in proper posture, the maintenance of Fowler position, force fluids, by every avenue except the mouth for the first few days, the Murphy drip, subcutaneous and intravenous infusion of normal salt solution, and in extreme cases blood transfusion. After the first day or two water, crushed ice, and other fluids, may be cautiously administered by mouth in gradually increasing quantities. Morphine in sufficient quantity to keep the patient quiet and reasonably comfortable is always indicated, with holding it, except in cases of individual idiosyncrasy is to be condemned.

The dangerous period is from the third to the fifth day, but even then, in the absence of peritonitis and with tensionless approximations, the danger of leakage is probably over estimated.

Dehydrated patient should receive 3000 cc. daily for five days; with patient in better condition for three days. Standard treatment for the same severe operation upon the stomach is as follows.

- I. Firstday- first 2 hours nothing by mouth; then coffee and salt solution every hours by Murphy drip; 1500 cc. salt solution by hypodermoclysis.

2. First day second 12 hours, crached ice by mo mouth; 1000 cc. <sup>slit</sup> solution by hypoder-moclysis.
3. Second day- water by mouth, gradually in-creasing to 30 cc. every 2 hours. Proctocly-sis continued.
4. Third day- water by mouth 20 cc. alternating with egg albumin 5 cc. every hour.
5. Fourht day- and fifth day- gradually increas-ing water and albumin by mouth. Protoelysis continued.
6. Sixth to seventh day- Clear flavoured soup, dilute orange juice, increasing to 60 cc. every 2 hours.
7. Eight and ninth day- Water by mouth as desired. Proctoclysis discontinued.
8. Tenth day- Soft boiled eggs.
9. Eleventh day - Soft diet, milk toast, baked potatoes, creamed chicken added to diet.
10. Tenth to 21 day- Light diet. On the eight day give one ounce mineral oil, if the bowels fails to move; give castor oil.

R É S U M É

That almost all surgeons agree that there is no standard operation that could be employed in every case of peptic ulcer, and the mode of procedure is to be decided upon after the abdomen has been opened and the diseased parts have been inspected and the condition of patient good;

That operative procedure selected will then be determined by the surgeon's opinion regarding the following important considerations (1) the importance of removal of the ulcer bearing area of the stomach (2) the efficacy of the reduction of gastric acidity by a large resection (3) the possibility of carcinomatous transformation;

That investigation has shown that medical treatment of ulcer is attended by just as grave risk as is surgical treatment and that mortality is higher taking into account the results of perforation and hemorrhage while under treatment;

That medical treatment is dangerous, prolonged and it looks as a very tedious business;

That medical treatment of the past has failed very badly, and it fails too often to-day;

That unbulatory and perfunctory treatment of peptic ulcer by triple carbonates adequate dietary res-

triction has added much to surgical anxiety and unhappy experience;

Whereas, gastric and duodenal surgery offers the ultimate cure or most, if not all, the ailments of peptic ulcer;

In that Mayo states that gastro-enterostomy cures about 90 per cent. of duodenal ulcers, however, continental surgeons were unable to prove this statement; and Mayo says that 50 per cent. of patients not relieved by gastro-enterostomy is functional and may be help by medical treatment;

In that partial gastrectomy is gaining recognition here and abroad, and if the patients condition permits, it offers the best chance of complete cure and the total mortality after resection is much smaller in comparison than gastro-enterostomy and the end results infinitely better;

In that failure of pyloroplasty has been due to the fact that the operation has sometimes been pushed beyond its limitation or performed in spite of definite contraindications;

In that chronic ulcer operated upon in a quiescent stage; pyloroplasty is preferred or partial gastrectomy followed by Haberer and Finney's modification of Billroth I method.

In that coat sleeve resection of the stomach is considered inferior in result to partial gastrectomy;

In that total gastric resection has a very limited use but has been employed for carcinoma of the stomach and linitis plastica and may be considered in rare forms of destructive inflammation of the stomach.

That after all is said and done, whether medical or surgical treatment is employed in the treatment of peptic ulcer, after this lengthy discourse, I believe that the ulcer is better "out than in". Just what operation must be used depends upon entirely to the operating surgeon whose ability to decide in a given case is unique, and it commands the greatest respect of his fellow physicians in other branches of medicine.

Conclusion:

C O N C L U S I O N

There can be no better explanation of the general rule when there are many cures for any given condition advocated by as many different men, the ideal solution has not yet been found. For when the ideal is found there can be no two opinions and, as in the case of diphtheria, there will be only one method of treatment. Grievous and irreparable harm may be done by the surgeon, and his practice is brought thereby into disrepute. It is not only the patient who is sacrificed our cause is wounded in the house of our friends.

## B I B L I O G R A P H Y

---

1. Aberrerombrie, J.: Contribution to the Pathology of the Stomach, Pancreas, and the Spleen; Edinb. M. S. J. 21: 1 . 1824.
2. Baillie, M.: Morbid Anatomy of Some of the Most Important of Human Body, London 87: 1793 Quoted by Welch.
3. Balfour, D. C.: Indication and Treatment of Complications of Duodenal Ulcer, State Jour. Med. 23: 372-324. Sept. '27.
4. Balfour, D. C.: Factors on Safety in Gastric Surgery Minn. Med. 7: 337-343 May. '24
5. Burges, F.: Quoted by Hagzard W. D.: Discussion of Surgical Cure of Gastric and Duodenal Ulcer, J. Tenn. M. A. 20: 1-5. May, '27.
6. Billroth, F.: Ein Beitrag zu den Operationen am Magen; Gastrorophie Wein, Med, Wehnschr, 27: 913 , 1877.
7. Brown H.P.: One hyndred cases at Pennsylvania and Presbyterian Hosp., Ann. Surg. 89:209 - 217. Feb. 1929.
8. Bastianelle, P.: Quoted by Luesohn.: Gastroduodenal in Surg. Treatment. Jour. Ame. Med. Ass. 87: 1649- 1652. Nov. '27.

9. Cushing, H. Exper. and Surg. Notes on Bacteriology of the Upper Portion of the Alimentary Canal Contribution to Sc. of Med. Baltimore 4: 543 -591 1900.
10. Cruveilhier, J.: Anatomie Pathologique du Corps Humain. Paris, 1829 -35, I. Livr. X, XX; 1835 -42, II. Livr. XXX, XXXI. Ab. Dean Lewis Prac. of Surg. 6:ch. VI. P.1.
12. Cruveilhier, J. Quoted by Dawes W. A. Jejunostomy, its Value in Treatment of Certain Ulcers of Stomach and as Palliative Measure an Inoperable Carcinoma of Stomach, A. Clin. N. Amer. 1:1619 Dec. '21.
11. Cruveilhier, J.: Anatomie Pathologique du Corps Humain, Paris, 1829-35, I. Livre. X. XX; 1835- 42. Livr. XXX.; XXXI. Ab. Dean Lewis Prac. of Surg. 6:ch. VI. P.62.
13. Cabot, V. S.: Surg. in Peptic Ulcer, Minn. Med. 10: 412-418 July, '27.
14. Depage, : Resultats d' une Nouvelle Methode de Gastrostomie, Assoc. Franc. de Chir. Proc. Verb. Pav. 16: 332- 335 Oct. '03.
15. Erdman, J.: Quoted by Hossley, J.S. New Operation for Gastric and Duodenal Ulcer, Jour. Amer. Med. Ass. 73: 575 Aug. '29.



16. Finney, J.T. Surg. of Gastric and Duodenal Ulcer,  
Amer. Jour. Surg. I:323 -343. Dec. '26.
17. Finney, J. T.: Surg. of Peptic Ulcer, Canada, Med.  
Ass. Jour. I7: 400-404. Apr. '27
18. Finney, J.T.: Surg. of Gastric and Duodenal Ulcer,  
Amer. Jour. Surg. I: 323-343, Dec. '26.
19. Geissenbauer, C.: Die Partialle Magenresection. Eine  
Experimentelle, Operative Studie; Nebst. einer.  
Susammenstellung der im Pathologisch Anatomischen  
Institute zu Wien in dem. Zeitraume von 1817 bis  
1875 Beobachteten Magen Carcinome, Arch. F. Klin.  
Chir. Berl. 19: 347- 1896. Ab. Dean Lewis Prac. of  
Surg. 6: ch. VI. P 63.
20. Galpern, J.: Die Dauerfolge der Magenoperationen die  
Gutartigen Erkrankungen, Arch. F. Klin. Chir.  
Berl. 94: 87, '11.
21. Heineke ,C: Reported by Frommuller. Operation der  
Pylorusstenose, Inaug. Dissert.(Erlangen) Furth.  
P. 13, 1886.
- 23 Heineke, C. Operation der Pylorusstenose, Inaug. Dissert  
. Erlangen, Furth. P. 13. '86.
24. Haberer H. and Finney, J.T. Further Extension of  
Principle of Billroth I Method in Gastric Resection  
Zentralbl. F. Chir. 48: 847 June '21.

25. Jabouly, M. De la Gastro-Duodenostomie, Arch. Prov. de Chir. Paris, I: 551- '92. Ab. Dean Lewis Prac. of Surg. 6: ch. VI. P. 62.
26. Kocher, T. Zur Technik und zu den Enfolgen der Magenresektion, Cor.F. Schweiz; Aerzte, Basl. 23: 682- 713. '92.
27. Moynihan, E. Problems in Gastric Surg. Brit. Med. Jour. 2: 1021 - 1026. Dec. '28.
29. Nicolaysen, K. Patholigical anatomical und experimentelle Studier Uber die pathologenesse dei chronischen Magengeschanurs. D. Zeithsch F. Chir. Leipz, 15: 145- '21.
30. Merren, D. C. Animadversiones Quaedam Chirurgical Experimentis Animalibus Gastis, Illustratee. Gissae, 1810.
31. Mayo, C. H.: Gastroduodenostomy, Surg. Gyn. Obst. 38: 583 '24.
- 32: Mayo, C. H. Gastroduodenostomy, Surg. Gyn. Obst. 38: 583 - '24.
33. Mayo, W. J. Radical Operation on Stomach with Special Reference to Mobilization of Lesser Curvature, Surg. Gyn. Obst. 36: 447- 453 Arp.'23 .
34. Meherin J. M.:Partail Gastrectomy in Hand of General Surgeon. Amer. Med. Jour. Surg. 12: 260 -265. May, '31.

25. Peck, C. H. Ann. Surg. 80: 31-41. July, '24.
26. Rydygier, : Die erste Magenresection beim Magengeschwür berKlin, Wchnschr. 2: 480, '85. Ab. Dean Lewis Frack of Surg. 6:ch. P.2.
- 27, Rokitansky, C. Das perforirende Magengeschwür Handb. d' Spec. Path. Anat. II: 187, '42.
28. Rosenow, E. C.: Etiology of Spontaneous Ulcer of Stomach Jour. Inf. Dis. 32: 384 -87, '23.
29. Rosenow, E. C.: The Production of Ulcer of the Stomach by Injection fo Streptococci, Jour. Amer. Med. Ass. 61: 1947 '13.
40. Reeves, J. B. Arteries Supplying Stomach and Duodenum and their Relation to Ulcer Surg& Gyn. Obst. 30: 374- 380. Apr. '20.
41. Russ, W. B.: Jour. Amer. Med. Ass. 97: 1618- 1619. Nov. '31.
42. Rodman, W. L.: Excision of the Ulcer Bearing Area in Gastric Ulcer, Jour. Amer. Med. Ass. 43: 801 '04.
43. Schuller, : Klin und Exper. unter Suchungen uber die Function des Magensnach Gastro-enterostomie und Pylorus Resection, Mitt. a.s. Grenzgeb. Med. u. Chir. 22: 1911.
44. Takats G. de.: Surgery of Gastric and Duodenal Ulcer Experience of First Clinic Uni. of Budapest, Amer. Med. Jour. on Sc. 83: 217- 222. Feb. '26.

45. Wolfler, A.: Gastroenterostomie, Zentrolb. F.Chir.  
Leipz. 8: 707, 1881. (Original description of gastro-enterostomy.)
46. Wolfler, A.: Gastro-enterostomie, Zentralb. F. Chir.  
Leipz. 8: 705, 1881. Ab. Dean Lewis Prac. of Surg.  
6:ch. VI. P.2.
47. Walton, A. J.: Simple ulcer of the Stomach, Proc, Roy.  
Soc, Med. (Sect. Surg.) 24: 107- 118. July '31.
48. von Eiselsberg, H. A. Uber die Magenresektionen und  
Gastro-enterostomieen, etc. Arch. F. Klin. Chir.  
Berl. 39: 785 -840. '89. Quoted by Paterson, H.J.  
Gastrojejunosotomy vs. Partial Gastrectomy in Gas-  
tric Ulcer, Post. Grad. Med. Jour. 3: 5-8. Oct. '27.
49. von Hacker, H.: Zur Caustik and Statistik der Magen-  
resektionen und Gastro-enterostomieen, Arch. F. Klin  
Chir. Berl.32: 6K6- 621. '85.