Henry Ford Hospital Medical Journal

Volume 1 | Number 2

6-1953

The Billroth I Gastrectomy

Laurence S. Fallis

Follow this and additional works at: https://scholarlycommons.henryford.com/hfhmedjournal

Part of the Gastroenterology Commons, Life Sciences Commons, and the Public Health Commons

Recommended Citation

Available at: https://scholarlycommons.henryford.com/hfhmedjournal/vol1/iss2/3

This Article is brought to you for free and open access by Henry Ford Health System Scholarly Commons. It has been accepted for inclusion in Henry Ford Hospital Medical Journal by an authorized editor of Henry Ford Health System Scholarly Commons. For more information, please contact acabrera@hfhs.org.
THE BILLROTH I GASTRECTOMY
LAURENCE S. FALLIS
Henry Ford Hospital
Surgeon-in-Chief

It is of historical interest that the operation of partial gastrectomy antedates that of gastro-enterostomy. In 1881 Theodor Billroth removed the pyloric segment of the stomach for carcinoma. Gastrointestinal continuity was restored by anastomosing the end of the stomach directly to the duodenum. In the same year, in which this first successful partial gastrectomy was performed, Billroth's assistant, Anton Wolfier, seeking to emulate his master, was operating on a patient with carcinoma of the pyloric end of the stomach. He found it technically impossible to remove the lesion, and was about to close the abdomen when his assistant, Nicoladoni, suggested short circuiting the tumor by anastomosing the upper jejunum to the stomach, proximal to the tumor. Thus Wolfier performed the first gastro-jejunostomy.

The first partial gastrectomy was of the type known as Billroth I, that is, direct anastomosis of the end of the stomach to the end of the duodenum. Certain difficulties arose in the practice of this operation, due principally to the inequality of the lumen of the structures to be united. Many modifications of the original Billroth I procedure were adopted by Billroth and his contemporaries, the principal modification being that of closing a portion of the lower end of the stomach so that the opening approximated the caliber of the duodenum and allowed for a more careful approximation by direct end to end anastomosis. Like the solutions of many problems this brought with it a problem of its own, namely, a three point angle of suture was produced at the superior border of the duodenum. It was here that the difficulties with healing of the anastomosis developed. The earlier German literature on the subject contains many references to this fatal angle or "angle of sorrows," so-called because of the number of anastomotic failures. It was not until 1885 that Billroth himself conceived the idea of utilizing the jejunum for the anastomosis rather than the duodenum after removal of the lower end of the stomach. This procedure, known as the Billroth II operation, very quickly received universal acceptance because of its safety factor, since an end to side anastomosis is always more secure than an end to end anastomosis. The popularity of this operation is attested by the fact that some forty modifications of the original procedure have been introduced. All went well with the Billroth II operation until partial gastrectomy was adopted for the treatment of the duodenal ulcer. However, as accumulated case records began to be published it soon became evident that a definite number of patients developed jejunal or marginal ulcers after gastric resection. The prevention of jejunal or marginal ulcer is, therefore, one of the great problems of the gastrectomist at the present time. Since this complication develops in patients with high acid values, more and more of the stomach has been resected in an endeavor to avoid the development of jejunal ulcer and while it may be said that the incidence of jejunal ulcer is less in patients with a high gastrectomy than in those who have a minimal, or
subtotal operation, there is still a definite number of patients who develop jejunal ulcer even after adequate resection. The removal of increasing amounts of stomach, in its turn, has lead to the development of other complications, such as nutritional deficiencies, and the appearance of the so-called dumping syndrome. At the Henry Ford Hospital we have attempted to solve this problem by the addition of vagotomy to the operation of partial gastrectomy, and by utilizing the Billroth I procedure as frequently as possible. It is, of course, manifestly impossible for a patient to develop a jejunal ulcer after subtotal gastrectomy performed with the Billroth I technique, although a new duodenal ulcer, or marginal ulcer may appear. The Billroth I operation, as performed at this hospital, is a modification of Billroth’s original procedure and might more properly be called the Billroth I–Schoemaker procedure, since it employs the modification of tubing of the stomach suggested by Schoemaker. The principle here involved is complete mobilization of the stomach by sectioning the left gastric artery at its point of origin and removal of the entire lesser curvature. When the stomach is closed after removal of the lesser curvature a tube-like elongation of the stomach is produced so that the caliber of the end of the stomach roughly approximates that of the duodenum. In this fashion a safe direct anastomosis can be made without tension. The keynote of the Billroth I operation is mobilization of the duodenum and this means not only mobilization of the duodenum, but mobilization of the head of the pancreas. If attention is directed to mobilizing the head of the pancreas, rather than the duodenum itself, the mobilized head of the pancreas brings the duodenum over toward the mid line. The secret of this manoeuver lies not only in cutting the peritoneum along the greater curvature of the duodenum, but also in cutting the fascia propria which binds the head of the pancreas to the posterior abdominal wall. In this fashion the duodenum can be easily and thoroughly mobilized. The advantage and importance of this manoeuver cannot be overemphasized. Moreover, section of the vagus nerves increases the mobilization of the stomach and several centimeters in length of the gastric stump is produced. In this manner the basic principle of all gastrointestinal surgery, namely, that of adequate mobilization and suture without tension is maintained. Thus the operation can be performed as safely in the majority of instances as the Billroth II procedure. In certain cases scarring of the duodenum, retraction of the duodenal cap, and ulceration in the proximal duodenum, render the situation impossible for direct anastomosis of the end of the stomach to the end of the duodenum. Under these circumstances the modification of Finney and von Haberer is introduced, namely, that of closing the end of the duodenum and making the anastomosis between the end of the stomach and the side of the descending duodenum. This is simply a modification of the Billroth I procedure and is, in fact, the only manner in which the direct duodenal anastomosis can be made in many cases of duodenal ulcer. The Billroth I operation cannot be utilized in all patients. It is our policy to mobilize the stomach and fashion the gastric tube before making a decision as to whether or not to apply the Billroth I procedure. If the structures can be anastomosed without tension, then we proceed with the Billroth I operation. If there is any contraindication, we do not hesitate to carry out a routine Billroth II operation.

The rationale of the Billroth I operation may be cited, as follows:
1. Anatomic—The normal anatomic relationship is restored.

2. Physiologic—Gastric contents after operation are poured into the duodenum, an organ accustomed to receiving acid secretion and, theoretically at least, better adapted for this purpose than the jejunum.

3. Technical—(a) The entire operation is performed in the supracolic compartment, a fact of definite value when dealing with substandard patients and when the procedure must be carried out under local anesthesia, since disturbance of the colon, mesocolon and small intestine is avoided. (b) The duodenal stump should be more secure, since back pressure on this area is impossible. (c) Postoperative gastric retention due to mechanical kinking at the stoma does not occur.

The following objections have been raised: 1. The operation technically is more difficult than gastro-jejunostomy. 2. Insufficient stomach is resected. This objection is invalidated if the duodenum and stomach are adequately mobilized and the decision to utilize the operation is not made until after the resection is accomplished. 3. Reflux of beneficial alkaline duodenal contents into the stomach is less than after gastro-jejunostomy. Continuous postoperative gastric aspiration in comparable groups of patients has shown that there is no appreciable difference in the amount of duodenal contents removed. 4. Complete mobilization of the duodenum increases the tendency to duodenal ileus. This did not occur in any of our patients.

COMMENT AND PERSONAL EXPERIENCE

My interest in this type of anastomosis was first aroused by its employment in the treatment of jejunal ulceration following gastro-jejunostomy and recurrent jejunal ulceration after adequate subtotal gastrectomy. Later, in performing gastrectomy under local anesthesia in patients with massive hemorrhage and other substandard patients its advantages were again apparent, because the operative procedure could be carried out entirely in the supracolic compartment. On the basis of an encouraging beginning the scope of the operation has been extended gradually until approximately two-thirds of the gastrectomies are now done according to the method described in the foregoing. This operation has now been performed in this hospital on approximately two hundred patients. Dr. James Baltz of the Division of Gastro-Enterology has recently completed a study of sixty-eight of these patients followed for a period of from three to five years after operation and, in this group, has been able to unearth only one suspected example of marginal ulcer. In an equal number of patients following gastro-jejunostomy the incidence of jejunal or marginal ulceration is more than seven per cent. This encouraging figure has given us much impetus to continue with this type of combined operation, namely, Billroth I anastomosis plus vagotomy. At this time it is not clear that the Billroth I procedure alone has been responsible for the improvement. It may very well be that the addition of vagotomy is the actual factor of importance. Only time and much study will indicate the true and relative value of this operation. Meanwhile, the enthusiasm of all members of the General Surgical Staff for the procedure indicates the continuance of its use.