The place of the Murphy button in gastro-enterostomy / by Willy Meyer.

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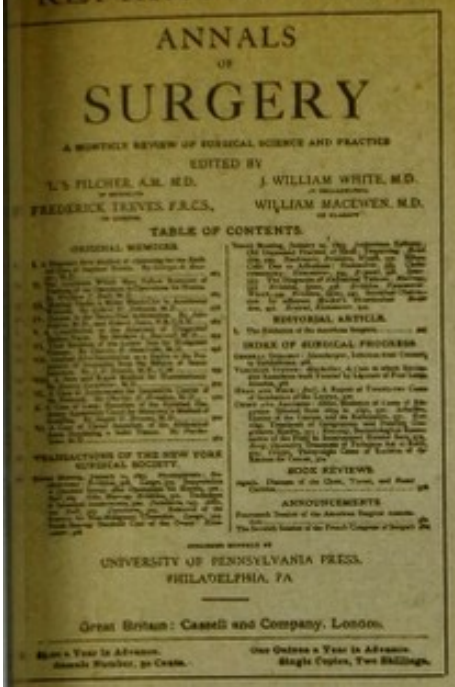
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L. S. PILCHER, A.M., M.D. J. WILLIAM WHITE, M.D.
FREDERICK TREVES, F.R.C.S. WILLIAM MACEWEN, M.D.
TABLE OF CONTENTS.
ORIGINAL MEMOIRS
EDITORIAL ARTICLES
INDEX OF SURGICAL PROGRESS
BOOK REVIEWS
ANNOUNCEMENTS
TRANSACTIONS OF THE NEW YORK SURGICAL SOCIETY
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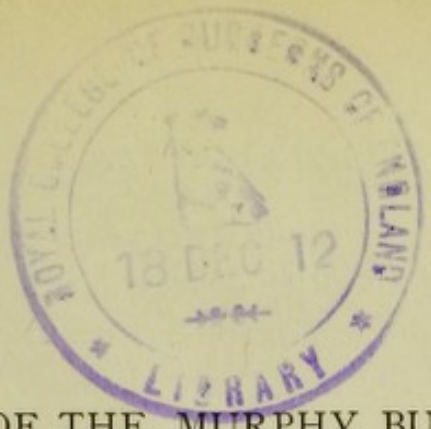
THE PLACE OF THE MURPHY BUTTON IN GASTRO-ENTEROSTOMY.

By WILLY MEYER, M.D.,
OF NEW YORK,
Professor of Surgery at the New York Post-Graduate Medical School and Hospital; Attending Surgeon to the German and New York Skin and Cancer Hospitals; Consulting Surgeon to the New York Infirmary.



THE PLACE OF THE MURPHY BUTTON IN GASTRO-ENTEROSTOMY.[1]

By WILLY MEYER, M.D.,[1]

OF NEW YORK,

PROFESSOR OF SURGERY AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; ATTENDING SURGEON TO THE GERMAN AND NEW YORK SKIN AND CANCER HOSPITALS; CONSULTING SURGEON TO THE NEW YORK INFIRMARY.

Since Murphy has introduced his button into the surgery of the gastro-intestinal tract a large number of cases of gastro-enterostomy have been reported, in which the operators have availed themselves of the advantages of this contrivance. Surely the number is sufficient to enable us to draw definite conclusions as to the advantages and disadvantages of the button in this particular operation. Of special value in this respect are the reports of those surgeons who have used the button rather often. A collective list of single operations done by different men does not prove as much. The opinion as to the value of the device is too greatly influenced by the success or failure of the respective operations. Not a few have condemned the button, because their first and only attempt did not meet their expectations. There are surgeons who have not used the button at all in the lateral anastomosis between stomach and intestines, and yet believe themselves to be sufficiently well informed to take part in a respectful discussion. That in order to succeed, the application of the ingenious instrument also requires personal experience and strict adherence to the rules laid down by its inventor, has frequently been forgotten.

From a former discussion, which took place in the New

[1] Read before the New York Surgical Society, March 10, 1896.

York Surgical Society about two years ago, I have had the impression that the majority of New York surgeons are more or less opposed to the use of the button in performing gastro-enterostomy, even for malignant disease. In the eight patients who have been subjected by me to this operation with the help of the button, all for cancer of the stomach, the instrument has done so much good and has enabled me to extend the line of operability so much further, that I have thought it not amiss again to invite discussion on this very important question.

No doubt every surgeon has reason to complain that patients with cancer of the stomach reach him too late. This is especially distressing in cases with cancer of the pylorus, because it is just here that an early operation has some chance of producing a permanent cure. In the majority of cases we feel that our hands are tied, that we cannot do the good and thorough work we should like to do. We have to satisfy ourselves with giving the patient temporary relief only; we must perform gastro-enterostomy instead of pylorectomy.

The cause of this lamentable condition is partly due to the great difficulty still experienced by the internal physician in establishing an early diagnosis of an existing carcinoma of the stomach. The principal reason, however, is the great lack of confidence that up to the present date the general practitioner has in our operations on the stomach for malignant disease. And yet how much good can still be accomplished with the palliative operation, even in almost hopeless cases! Some time ago a medical man of large experience witnessed one of my operations on a patient who had a marked cancerous stricture of the pylorus. On lifting the stomach out of the abdomen, the head of the pancreas appeared to be densely infiltrated. A large number of cancerous lymphatic glands were visible and palpable. Metastatic growths surrounded the jejunum in the shape of circular rings for a distance of about two feet. "Well, you are going to close this abdomen, aren't you?" he said, on looking at the

ravages of the disease. "No," I answered; "I am going to do gastro-enterostomy with Murphy's button." The anastomosis was accomplished in a few minutes. To-day the patient—then emaciated to a mere skeleton—has gained over thirty-five pounds and works in a shop with his comrades.

To show that with the help of Murphy's button we can materially widen the indication for gastro-enterostomy for malignant disease of the stomach is the object of this paper. My own eight cases are the following:

CASE I.—J. T., male, aged thirty-nine years. Gastric trouble for the last two years. Lately symptoms of pyloric stenosis. Palpable tumor in epigastrium. Hydrochloric acid present; no lactic acid. Marked cachexia. Referred to me for operation by Dr. Max Einhorn, of New York, August 6, 1894: laparotomy (German Hospital): Large infiltrating tumor in pyloric region, involving duodenum, omentum, and hepatic flexure of colon. Gastro-enterostomy (Woelfler). For this purpose stomach, omentum, and transverse colon are lifted out of the abdomen and the small intestine pressed towards the right. Upper portion of jejunum thus rapidly found. Anastomosis is easily perfected with the button. No additional sutures. Proximal end of jejunum then stitched to the fundus of the stomach with five to six interrupted silk sutures. (Fig. 2.) The same was done in all the following operations, except Case III.

Recovery undisturbed. On the sixth day after the operation some pain in stomach and a few attacks of vomiting. Tenth day after the operation patient out of bed. Discharged with firm cicatrix August 25. Button not found during stay at hospital. Slight œdema of left lower extremity. September 10, good appetite; patient able to take all kinds of food. Bowels normal. Button as far as known not yet passed. Leg more swollen; thrombosis of femoral vein. Died suddenly September 24. No autopsy. I believe that in this case the button had dropped into the stomach, probably on the sixth day.

CASE II.—A. D., male, aged thirty-nine years. Suffered from gastric pain and vomiting during nearly all of the last year. No palpable tumor; no gastrectasy; but ischiochymia; lactic acid present; absence of hydrochloric acid; some cachexia.

Diagnosis: carcinoma pylori (Dr. Einhorn). Laparotomy August 23, 1894 (German Hospital). Pylorus overlapped by the liver, but is not adherent to it; is strictured by a tumor. Multiple infiltrated glands in the greater omentum. Upper portion of jejunum easily found, as in the previous case. On gliding with the fingers downward to reach a coil with a long mesentery, a metastatic growth which surrounds the gut in the shape of a circular ring is encountered at a distance of twenty-six inches from the pylorus. A coil about seven inches farther down is selected for anastomosis and easily attached to the anterior wall of the stomach with the help of the button. No additional sutures. Recovery uninterrupted until the eighth day after the operation. Then sudden sharp gastralgia, defined by patient as an oppressive heavy feeling in the region of the stomach. Vomiting of large masses of a thin fluid of slightly fæcal odor. No rise of temperature; constipation; no passage of gas. Lavage of stomach; calomel (one-tenth grain in refracta dosi); bowels move. Probable diagnosis of compression of transverse colon excluded. Vomiting and pain continue. Diagnosis: Button has most probably dropped into the stomach. Under careful nursing patient recuperated slowly. Pain disappeared after about eight days and did not return. Patient soon out of bed. Lately frequent coughing spells with expectoration. Examination reveals tubercle bacilli in the sputum (hospital infection). Patient discharged October 10. Appetite good; all kinds of food are taken and relished; no vomiting. Has gained sixteen pounds within the two weeks. Button not yet passed. Improvement does not last long. Frequent attacks of coughing, night-sweats, fever. Readmitted to hospital November 6. Exitus lethalis November 12. Post mortem: No compression of transverse colon; anastomosis round as if punched out with a forceps; appears a little wider than the circumference of the button; border soft; not the slightest contraction; button within the stomach. Gastric mucosa shows no trace whatever that could be referred to the long presence of the button. Acute cheesy pneumonia of the entire right lung.[2]

Case III.—D. H., male, aged thirty-eight years. Complains for the last year and a half. Palpable tumor somewhat to the left of the median line. Symptoms of pyloric obstruction. Very emaciated. Operation October 3, 1895. At the pylorus a nodular

growth of about a walnut's size encroaching upon the anterior gastric wall. Stomach contracted. Woelfler's operation impossible. Stomach with omentum and transverse colon are therefore lifted out of the abdomen and raised upward. The mesocolon transversum is bluntly perforated at a spot, somewhat to the left of the spinal column, which showed a rather scanty amount of blood-vessels, and the borders of this wound are fastened to the underlying bowel by a few stitches. It proved very difficult to identify the upper portion of the jejunum on account of multiple metastases within the abdominal cavity and manifold adhesions between the different coils of the intestines. Von Hacker's anastomosis is then perfected with the button. No additional sutures. Patient reached his bed with a pulse of 84; felt comfortable during the first two days. No rise of temperature; pulse never above 100. On the third day after the operation a laxative is administered. Soon after beginning tympanites, which increased on the following day. Repeated vomiting of a small amount of thin fluid with fæcal odor. Lavage of the stomach brings no help. Bowels move somewhat. Intravenous saline infusion of 1200 cubic centimetres. Temporary improvement. Died, October 8, on the fifth day after the operation. Post mortem: No peritonitis; button still in place; jejunum and part of ileum greatly distended; stomach exceptionally small; pylorus not entirely obstructed; its lumen irregular, of the size of a small lead-pencil; posterior gastric wall intact. On analyzing the seat of the anastomosis, which is situated to the left of the spinal column, it is found that a communication had been established between the duodenum, right below the pylorus, and a spot of the ileum about twelve inches above the ileo-cæcal valve.[3] The proper explanation of symptoms observed in this patient after the operation seems to be this: On the third day after the operation the small intestines had, after the laxative, commenced to regurgitate a great mass of their contents through the anastomosis back into the duodenum. This produced the tympanites, and by pressing some of the liquid through the rigid yet passable pylorus into the stomach, also the vomiting of the thin fæcal matter. The case illustrates what mistakes can occur through the presence of multiple adhesions within the abdomen and a small-sized stomach. In carrying out this operation I had carefully searched for the upper part of the jejunum in the usual manner, and had been sure that I had

properly performed a posterior gastro-enterostomy and not a duodeno-ileostomy, as was actually the case.

CASE IV.—M. W., male, aged forty-one years. Sick with gastric disturbances for the last eight months. Moderate ischiochymia; hydrochloric acid present; no lactic acid; palpable tumor. Had been very much opposed to operative interference. Fed per rectum for the last eight days on account of persistent vomiting. Patient extremely cachectic. Referred to me for operation by Dr. Einhorn. January, 1896, laparotomy (Post-Graduate Hospital). Narcosis stopped as soon as the abdomen is incised. Anterior gastro-enterostomy with the button. No additional sutures. Feeding by mouth begun as soon as patient had reached his bed. Euphoria for the first six days. On the seventh the first abdominal sutures are removed. During the night a marked sneezing spell. On the following morning the visiting assistant found that a part of the wound had separated and a few coils of the small intestine been pushed out of the abdomen. They had evidently been out for a number of hours and were found to be matted together with the covering gauze and cotton. Immediate reduction and insertion of new sutures seemed imperative. This was done with all aseptic precautions under constant irrigation with saline water. Soon after this procedure the temperature began to rise and the pulse went up. On my arrival at the hospital a large amount of slightly colored water could be pressed out of the abdomen between the additional sutures. In spite of stimulation patient sank and died after twelve hours.

CASE V.—H. B., female, aged thirty-five years. Palpable cancer of the stomach. Moderate emaciation. July 1, 1896, anterior gastro-enterostomy with the button easily and rapidly done (German Hospital). No additional sutures. Died July 3 of septic peritonitis. Post mortem: Perforation at seat of approximation. Button had cut through duodenum in length of about one-half inch. On unscrewing the instrument it could be well demonstrated that the running suture held the tissue well drawn over the edge of the button around the central canal. Probably on account of irregular traction on the coil of the jejunum the gangrene of a part of the latter had rapidly set in and perforation occurred before a thorough agglutination had taken place.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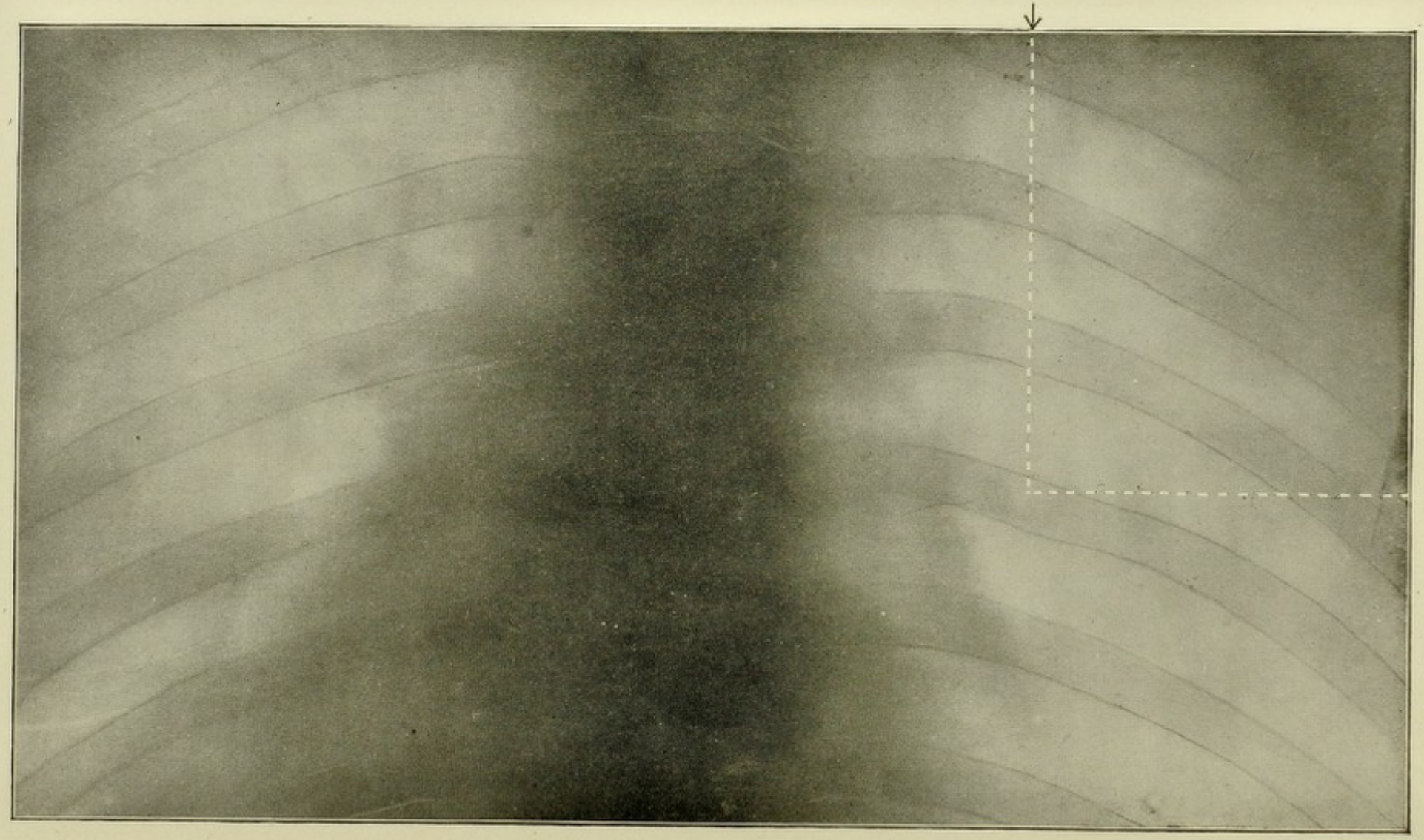

FIG. 1.—Skiagraph showing button in stomach, from Case VII, photographed thirteen weeks after operation.

CASE VI.—G. P., male, aged forty-two years. Admitted to German Hospital in July, 1896, on account of extreme anæmia. Intra-abdominal malignant growth suspected, but its existence not diagnosticated. Discharged unimproved. Readmitted October 26 with large tumor of the stomach. Frequent vomiting; great pain; and marked anæmia. Patient begged for relief at all hazards. October 31, exploratory laparotomy. Tumor of pylorus involves a greater part of the gastric wall, especially towards the lesser curvature. Gastro-enterostomy still feasible. Is carried out with the button (Woelfler). Additional continuous Lembert suture with silk, bringing in apposition about one-third of an inch more of serous surfaces around the edge of the button. The latter is thus completely buried. Patient stood operation very nicely. Feeding through mouth begun at once; took almost one quart of fluid during the first twenty-four hours. Vomiting on second and third day successfully overcome by repeated lavage. Soon out of bed. Died of exhaustion November 15. Post mortem: No peritonitis; anastomosis firm and wide; button in stomach.

CASE VII.— S. K., male, aged thirty-one years. Stomach trouble for the last six months. Incessant vomiting. Has lost over sixty pounds. Careful analysis of the stomach contents shows ischiochymia, lack of hydrochloric acid, presence of lactic acid. Patient extremely emaciated. Referred to me for operation by Dr. Einhorn. November 7, gastro-enterostomy (German Hospital). Pylorus underneath the liver presents an infiltrating tumor. On lifting it out of the abdomen with omentum and transverse colon a great number of smaller and larger infiltrated lymphatic glands are found; the head of the pancreas is carcinomatous. Upper portion of jejunum for a length of about two feet surrounded by at least ten to twelve circular tumors of the same character as that of the pylorus. Anterior gastro-enterostomy with the button. Additional continuous Lembert suture of silk. Patient reached his bed with a pulse of 80. Uninterrupted recovery. Discharged December 3. Presented to the New York Surgical Society December 23, 1896 (ANNALS OF SURGERY, Vol. XXV, No. 3, p. 369), and March 10, 1897. Has gained thirty-seven pounds. Works in a shop for the last four weeks. Button in stomach as proved by the X-rays. (See skiagraph.)[4]

CASE VIII.—J. M., male, aged forty-five years, of New York, has vomited for the last six months soon after meals; has lost forty to forty-five pounds. In the epigastrium a large sausage-shaped hard tumor, painful to the touch. No ectasy of the stomach; no succussion; metastatic growths palpable within abdomen. Solid food does not pass pylorus. Meat, potatoes, and rice are washed out of the stomach eighteen hours after the meal. Patient always hungry. Referred to me for operation by Dr. S. M. Michaelis, of this city. Laparotomy February 5, 1897 (German Hospital). Large tumor, involving pylorus and adjacent parts of the stomach. No visible ectasy. In pushing the hand under the left ribs towards the cardia the fundus, free of cancer, is detected. It is impossible to properly expose the posterior wall of the stomach on account of many adhesions and multiple glandular enlargements. Woelfler's operation alone is feasible. For this purpose the stomach is drawn with difficulty into the wound and kept there through the efforts of an assistant. It requires some skill to expose within the abdominal wound a small portion of the gastric wall about two inches away from the border of the growth, large enough to insert the button. Gastro-intestinal anastomosis by suture, even not more than one inch long, would have been a technical impossibility. Coil of the jejunum with a long mesentery selected. Button closed. Additional continuous Lembert suture (silk) very difficult. As soon as traction on the stomach ceased, the place where the anastomosis had been made disappeared under the left ribs. Aseptic course; vomiting on the second day and third day. Lavage followed by immediate injection into the stomach of one tablespoonful of Epsom salts dissolved in a few ounces of water. Bowels move the following night. Then obstinate singultus, which is successfully overcome with hypodermics of morphine in very small doses. Patient out of bed six days after operation. Left hospital February 26; eats now everything; no vomiting; has gained ten pounds within the last twelve days. Button, as far as known, not yet passed.

Before discussing several essential points, which come up in perusing these histories, a brief review of recent literature on this subject may perhaps be welcome. I shall mainly consider the reports of those gentlemen who have used the button more than once.

In 1894, H. Mynter, of Buffalo, reported three cases, with one recovery and two deaths. The latter was due to exhaustion in one case (twelve hours after the operation). In the other patient, "the smallest size button was used," as the operator had no other at the time. The button was so small that it was impossible for it to hold a sufficient amount of tissue to retain the margin of a thick wall as that of the stomach within its grasp. The wall slipped away from the clasp of the button, the gastric contents escaped into the peritoneal cavity, and caused death.

Lately Theodore A. McGraw, of Detroit, read a paper before the Detroit Medical and Library Association, in which he gives the history of two cases of malignant pyloric obstruction, successfully operated upon by posterior gastro-enterostomy with the help of Murphy's button. A third case, recently operated upon by the same surgeon, with those two published, have been embodied in the table given below.

The following reports come from German clinics. It has been most interesting to me to watch the recognition the button has found by German operators. When I had published in Nos. 37 and 52 of the *Centralblatt für Chirurgie*, 1894, the experience I had had with the Murphy button in the surgery of the gastro-intestinal tract within the first eight months of 1894 (eight cases), Dr. Zielewicz, of Posen, as the first, answered in a rather comical way, by giving the report of an unsuccessful case of gastro-enterostomy, in which the patient had died on the eighth day after the operation, after having swallowed half a pound of sausage that had been smuggled into the hospital. At the autopsy a perforation at the seat of the approximation was found, and the button hanging on the thread of silk, which had been used for tieing in the two halves. Zielewicz asked, What caused the death of the patient, the sausage or the button? At the end of his article, he stated that he preferred to stick to needle and thread. In my answer to Zielewicz's article, *Centralblatt für Chirurgie*, 1894, No. 52, I proved that in view of the condition found at the post-mortem the button had evidently been wrongly inserted.

Then in *Centralblatt für Chirurgie*, 1895, No. 4, there appeared a brief note of Professor König, in which he also preferred to stick to the suture. He had not yet made use of the button in an operation, but expressed the fear that the ease in establishing entero-anastomosis with the help of the button might induce inexperienced men to perform an operation which they otherwise would not dare to undertake. These words, coming from one of the most eminent and leading surgeons of Germany, had their weight. Instead of being tried as to its merits everywhere, the button was used by a very few surgeons only. Yet these few (Schede, Czerny, Woelfler, Sieck, Kuemmel, Plettner, Brenner) had such gratifying results, and the experiments with the button they had made by their assistants on animals, showed such ideal macroscopic and microscopic approximation, that they all soon became warm friends of the ingenious instrument.

In 1895 the late R. von Frey, assistant of Professor Woelfler, then in Gratz, published in a brilliant article, on the technique of intestinal suture,[5] three successful cases of posterior gastro-enterostomy (von Hacker) done with the help of Murphy's button. One patient was operated by von Frey, the other two by Woelfler.

In 1894 I had proposed,[6] rather to do von Hacker's gastro-enterostomy, in order to put the button in as low a spot of the gastric wall as possible, thus favoring its entrance into the jejunum. I had found at the autopsy of my second case of gastro-enterostomy, carried out according to Woelfler, that the button had dropped into the stomach. (See above list.)

At the last congress of German surgeons at Berlin, 1896, Professor Czerny, of Heidelberg, reported eleven cases of entero-anastomosis with the help of the Murphy button.[7] In five gastro-enterostomy had been successfully done, four times for cancerous, once for cicatricial stricture of the pylorus. In each of these five cases the anastomosis had been placed on the posterior side of the stomach. Czerny considers the invention of Murphy's button an important step in the evolution of intestinal suture. In his opinion, the

method saves time, which, in many cases, is of great importance. It is also easier in its technique than the exact intestinal suture. He thinks it will come into more common use, but he would like to have the button made of an absorbable material. Perhaps mucilage, hardened in formaline, would answer the purpose.

The most thorough trial the button has so far had abroad was given it in the Neue Allgemeines Krankenhaus in Hamburg-Eppendorf by Schede, Sieck, Kuemmel, and Rieder. Two important articles have been published from this source. The one is written by H. Graff, assistant,[8] the other by Kuemmel himself, the successor to Professor Schede.[9]

Among twenty-five operations mentioned by Graff and done by Schede, Sieck, and Rieder, there were fourteen gastro-enterostomies, five for benign pyloric stenosis, with five recoveries, and nine for malignant, with three recoveries. Besides, Schede often made use of the button in his private practice, always successfully. In none of the fatal cases was death due to the button, as proved by the autopsy. In one the button had indirectly helped in causing the exitus lethalis; too large an instrument had been selected for the anastomosis. It blocked the lumen of the duodenum, causing the gall to flow into the stomach. During the attempt at washing the stomach on the following day the patient suddenly died. Post mortem did not reveal the cause of this accident.

Kuemmel used the button in all fifteen times, within one year (May, 1895, to May, 1896); among these, nine times in gastro-enterostomy,—viz., eight times for cancerous disease. once in a benign case,—with seven recoveries and two deaths. Cause of death was in the one case collapse on the day following operation; in the other, peritonitis induced by an insufficient suture. Here Kuemmel had tried a modified suture. After opening the stomach, he had pushed the button into one corner of the wound and closed the incision with a double continuous suture. He had done this repeatedly before with impunity. After this death, due to this modification, he now strongly advises always to use the purse-string suture, as originally devised by Murphy. Kuemmel con-

siders the button "a specially valuable help in gastro-enterostomy on very weak patients, where every minute less consumed in the operation means a gain for the patient."

In order to be in our work as radical as possible, he also proposes to do pylorectomy in very weak patients, where the pyloric tumor can still be entirely removed by excision, in two times,—viz., first, gastro-enterostomy with the button, and three weeks later extirpation of the carcinoma. The cut end of the divided stomach and duodenum are then closed separately by suture. After successful gastro-enterostomy, these patients generally recuperate so rapidly that they are well able to stand a second operation after about three weeks.

Brentano[10] gives a casuistic report of eighty-one gastro-enterostomies done with the button, with forty-three recoveries and thirty-eight deaths, or a mortality-rate of 46.91 per cent.

Duvivier, of Paris,[11] has collected thirty-seven gastro-enterostomies done with the same mechanical means, with twenty recoveries and seventeen deaths, or a mortality-rate of 45.94 per cent.

In a recent tabulation of Dr. J. B. Murphy (not yet published), comprising forty-five cases of gastro-enterostomy performed with his button, and of which I make use with the kind permission of Dr. Murphy, I find twenty-eight recoveries and seventeen deaths, or a mortality-rate of 37.77 per cent.

From answers to a circular sent out by me to American surgeons, I have succeeded in collecting twenty-five cases of gastro-enterostomy, most of them not published, done with Murphy's button. Of these twelve recovered and thirteen died. Adding to these twenty-five my own eight cases, with five recoveries and three deaths, we have a series of thirty-three cases, with seventeen recoveries and sixteen deaths, or a mortality rate of 48.48 per cent.

Patients living less than fourteen days after the operation were counted (without regard to the cause of death) as "not recovered." The cases are specified in the following table.

No.	Operator.	Sex.	Age.	Malignant Stricture.	Benign Stricture.	Operation Anterior (Woelfler).	Operation Posterior (von Hacker).	Were any Additional Interrupted Sutures, or was a Continuous Suture made Around Approximation?	Recovery from Operation.	How many Days after Operation? Died.	Cause of Death.	Still Alive. How long after Operation?	Button passed per Anum. On which Day after Operation?	Button found in Stomach as proved by Autopsy.	Remarks as to Metastases in Abdominal Cavity found at Time of Operation, etc.
1	Oscar H. Allis, Philadelphia.	Male.	40	1	.	1	.	Additional suture after clamping the sides of the button; I think continuous.	Yes; returned to moderate degree of activity; gained flesh for a time.	One and a half years.	Extension of disease.	. . .	. . . .	Yes; button had lain in the stomach up to the time of death.	Whole region about the pylorus involved.
2	John Ashhurst, Philadelphia.	Male.	Past middle life.	1	.	1	.	No.	. . . . .	Three days.	Simple exhaustion from enfeeblement before operation.	. . .	. . . .	Yes, as placed. Local condition progressing favorably.	
3	John Ashhurst, Philadelphia.	Female.	Past middle life.	1	.	1	.	No.	. . . . .	Seven days.	Unknown; no autopsy allowed.				
4	Charles K. Briddon, New York.	Male.	50	1	.	.	1	No.	Uneventful.	Living sixteen mos. after operation.	(?) There was a large mass at last interview in cæcum.	Sixteen mos.	Fourteenth day.		
5	Charles K. Briddon, New York.	Male.	39	1	.	.	1	No.	Died 19 days after operation; anastosis made too low down in ileum.	Nineteen days.	Inanition.	. . .	. . . .	1	
6	A T. Cabot, Boston.	Female.	41	1	.	1	.	Lembert stitches of fine silk all way around, interrupted.	. . . . .	Seventeen days.	Starvation. Persistent vomiting; strength kept up for two weeks by enemata, then rapid failure.	. . .	. . . .	Sloughs had cut through; button adherent in	Nodule on anterior surface of liver and involvement of retroperi-

No.	Operator.	Sex.	Age.	Malignant Stricture.	Benign Stricture.	Anterior Operation (Woelfler).	Posterior Operation (von Hacker).	Were any Additional Interrupted Sutures, or was a Continuous Lembert Suture made Around Approximation?	Recovery from Operation.	Died. How many Days after Operation?	Cause of Death.	Still Alive. How long after Operation?	Button passed per Anum. On which Day after Operation?	Button found in Stomach as proved by Autopsy.	Remarks as to Metastases in Abdominal Cavity found at Time of Operation, etc.
														place.	toneal glands.
7	Chas. K. Cole, Helena, Montana.	Female.	46	1	.	1	.	Neither.	No.	Five days.	Nephritis from ether inhalation.	. . .	. . . .	I	
8	B. F. Curtis, New York.	Male.	56	1	.	1	.	Continuous Lembert.	. . . . .	Eleven days.	Chronic intestinal obstruction; old peritonitis.	. . .	. . . .	Button in stomach still adherent to wound.	Death caused by operation because it lessened the *vis a tergo* necessary to overcome obstruction; no local peritonitis; wounds aseptic.
9	B. F. Curtis, New York.	Male.	66	1	.	1	.	Continuous Lembert.	. . . . .	Two and a half days.	Inanition from continued vomiting.	. . .	. . . .	Button in place; union good.	Lavage brought up some grape-skins (eaten surreptitiously), possibly vomiting due to obstruction of button.
10	L. W. Hotchkiss, New York.	Female.	29	1	.	1	.	Continuous Lembert.	Good.	Twenty-six days.	Exhaustion.	. . .	Found, post mortem, in ascending colon.		
11	F. Kammerer, New York.	Male.	50	1	.	1	.	Additional interrupted sutures.	. . . . .	Two days.	Inanition, exhaustion.	. . .	. . . .	*In loco.*	

12	F. Kammerer, New York.	Female.	36	1	.	1	.	Additional interrupted sutures.	. . . . .	Four days.	Inanition, exhaustion.	. . .	. . . .	*In loco.*	
13	F. Kammerer, New York.	Male.	34	1	.	1	.	Additional interrupted sutures.	. . . . .	Eleven days.	On eighth day drank much fluid; developed signs of peritonitis and died on eleventh; line of union gave way at one point.	. . .	. . . .	In stomach.	
14	F. Lange, New York.	Female.	. .	1	.	.	1	. . . . .	. . . . .	Five to six days.	Uremic symptoms.	. . .	No.	No autopsy made.	Metastases found in peritoneum.
15	F. Lange, New York.	Female.	. .	1	.	.	1	. . . . .	1	Eight months.	(?)	. . .	No.	No autopsy made.	
16	F. Lange, New York.	. . .	. .	1	.	.	1	. . . . .	1	Ten months.	. . . . .	. . .	No.	No autopsy made.	Metastases found in peritoneum, and also on the liver.
17	F. H. Markoe, New York.	Male.	48	1	.	1	.	1	Had returned home gaining flesh and free from symptoms.	Eight weeks after operation.	Exposure; grippe; pneumonia.	. . .	Twenty-fifth day.		Whole pyloric extremity of stomach involved and neighboring glands.
18	Theodore A. McGraw, Detroit.	Female.	61	1	.	.	1	Continuous Lembert suture.	Yes.	Yes, after arriving at his home.	Unknown.	. . .	Nineteenth day.	. . . .	Lymphatic glands involved.
19	Theodore A. McGraw, Detroit.	Male.	47	1	.	.	1	Continuous Lembert suture.	Yes.	. . . .	. . . . .	Yes, over five mos.	Not known to have passed.	. . . .	Lymphatic glands involved.
20	Theodore A. McGraw, Detroit.	Female.	60	1	.	.	1	Continuous Lembert suture.	. . . . .	Two days after operation.	Exhaustion.	. . .	. . . .	. . . .	Lymphatic glands involved.
21	Thomas S. K. Morton, Philadelphia.	Male.	29	1	.	1	.	Six interrupted sutures.	Yes.	Fifty-eight days after operation.	Exhaustion; extreme jaundice came on five weeks after operation.	. . .	So far as we know it never passed.	No post mortem obtained; had returned home.	Everything about pylorus plastered together; pancreas and liver evidently involved; no

No.	Operator.	Sex.	Age.	Malignant Stricture.	Benign Stricture.	Operation Anterior (Woelfler).	Operation Posterior (von Hacker).	Were any Additional Interrupted sutures, or was a continuous Suture Lembert around Approximation?	Recovery from Operation.	Died. How many days after Operation?	Cause of Death.	Still Alive. How long after Operation?	Button passed per Anum. On which day after Operation?	Button found in Stomach as proved by Autopsy.	Remarks as to Metastases in Abdominal Cavity found at time of Operation, etc.
															other extensions or metastases.
22	M. H. Richardson, Boston.	Male.	54	1	.	1	.	No.	. . . . .	Third day after operation.	Extravasation around button followed by peritonitis.	. . .	. . . .	. . . .	Nodules in liver.
23	W. W. Van Arsdale, New York.	Male.	37	1	.	.	1	No; simple overhand suture on button.	Yes.	Tenth day after operation.	Unknown; no peritonitis; good union; large anastomosis.	. . .	. . . .	Yes.	Cancer of pylorus commencing to spread in stomach and duodenum; many lymphatic glands involved.
24	R. F. Weir, New York.	Male.	25	Ulcer of stomach.	.	1	.	No.	. . . . .	Twelve hours.	Operation, etc., a secondary one to a gastro-enterostomy, Kocher's method, which resulted in bile contents regurgitating in stomach; egress from stomach by gastro-enterostomy opening being imperfect; then on fifth day a new gastro-enterostomy with Murphy's button done.				
25	Member of the New York Surgical Society (name could not be ascertained,—blank was not signed).	Female.	48	1	.	1	.	No.	Uneventful; poor condition at first, but no worse than before operation.	Forty days.	General asthenia; cachexia marked, increased by second tumor at lower end of descending colon.	. . .	. . . .	Yes.	

Tabulating the reports of those operators who have done gastro-enterostomy with the button three times or oftener, we arrive at the following result:

	No. of Cases.	Recovered.	Died.
1. Allgemeines Krankenhaus, Hamburg-Eppendorf (Schede, Sieck, Riedel)	14	8	6
2. V. Czerny, Heidelberg	5	5	..
3. J. D. Griffith, Kansas City, Mo.[12]	4	3	1
4. F. Kammerer, New York City	3	..	3
5. H. Kuemmel, Hamburg	9	7	2
6. F. Lange, New York City	3	2	1
7. Theodore A. McGraw, Detroit, Mich.	3	2	1
8. W. J. Mayo, Rochester, Minn.	5	4	1
9. Willy Meyer, New York City	8	5	3
10. H. Mynter, Buffalo, N. Y.	3	1	2
11. F. Terrier, Paris[13]	3	1	2
	60	38	22

This gives a mortality-rate of 36.66 per cent.

Tabulating those cases only which were done with the button by the same surgeons for cancerous obstruction of the pylorus, we get the following result:

	No. of Cases.	Recovered.	Died.
1. Allgemeines Krankenhaus, Hamburg-Eppendorf (Schede, Sieck, Riedel)	9	3	6
2. V. Czerny, Heidelberg	4	4	..
3. J. D. Griffith, Kansas City, Mo.	4	3	1
4. F. Kammerer, New York City	3	..	3
5. H. Kuemmel, Hamburg	8	6	2
6. F. Lange, New York City	3	2	1
7. Theodore A. McGraw, Detroit, Mich.	3	2	1
8. W. J. Mayo, Rochester, Minn.	3	2	1
9. Willy Meyer, New York City	8	5	3
10. H. Mynter, Buffalo, N. Y.	3	1	2
11. F. Terrier, Paris	3	1	2
	51	29	22

which is equal to a mortality of 43.13 per cent.

Tabulating those operations which were done with the button for benign stricture, we obtain the following result:

	No. of Cases.	Recovered.	Died.
1. Allgemeines Krankenhaus, Hamburg-Eppendorf	5	5	..
2. V. Czerny, Heidelberg	1	1	..
3. H. Kuemmel, Hamburg	1	1	..
4. W. J. Mayo, Rochester, Minn. . . .	2	2	..
	9	9	..

showing a mortality of 0.00 per cent.

The last collective investigation which I could find in American literature has been published by Murphy in the *Medical News*, February, 1895.[14] He records eighteen cases of gastro-enterostomy, with twelve recoveries and six deaths. In discussing this operation he says, "It is my opinion (and my practice is in accordance with it) that patients who are not in a condition to withstand a pylorectomy should not be operated upon." In accordance with this opinion, he sums up the group "gastro-enterostomy for malignant disease" as follows: "Gastro-enterostomy should never be performed on an extremely cachectic patient."

I do not agree with Murphy on this point. I think we have not the right to deny help to a patient in this deplorable condition, if there is still the slightest hope for a successful operation. If we define the work of the medical man as that of trying to save life and to ameliorate suffering, we ought to operate for obstructing pyloric cancer, even on "extremely cachectic patients," with the same propriety as we do in such patients gastrostomy for obstructing carcinoma of the œsophagus. There is in practice comparatively little difference whether the patient vomits soon after having swallowed or a few hours after his having partaken of food. In both instances the patient starves to death.

I see that Dr. McGraw shares this my opinion. He says in conclusion of his paper alluded to above, "I have briefly described these two cases to call the attention of the

profession once more to the relief, which surgery can give to these hopeless cases which it can rarely cure. It is a mistake for physicians to feel and say that it is not worth while to subject a patient to an operation which can only be of temporary benefit. Many of these patients live one, two, or even three years after a gastro-enterostomy. The most of them recover from the operation. If successful, there follows a long interval of relief and comfort, and death, when it comes, comes in a less terrible form."

Just in these extremely cachectic patients we feel almost the necessity to shorten the time of operation as much as possible, and reduce the handling of the intestines to a minimum, the two factors that combined with the effects of the general narcosis produce in these almost bloodless operations the so-called "shock." It has often seemed to me, in my operations on the stomach for malignant disease, in gastrostomy, as well as in gastro-enterostomy, that we have to fear the effect of general narcosis more than the operation itself. As long as we get the patients in this desperate condition from the hand of the internal physician, we will do wisely to avoid general narcosis as much as possible. This can be accomplished with Schleich's infiltration anæsthesia. So far I have proceeded in this way twice in gastrostomy successfully, but not yet in gastro-enterostomy. In one of the cases recorded (No. 4) general narcosis (chloroform drop by drop after cocainization of the nostrils) was used to cut down through the parietal peritoneum. The rest of the work could be well finished without anæsthesia. Czerny[15] has done a gastro-enterostomy with the button under cocaine anæsthesia.

That Murphy's button enables us to handle the bowels as little as possible in gastro-enterostomy, that it often helps to reduce the time of the operation, and therewith that of the general narcosis, no unbiased man will deny. I believe the time will come, just in operation for cancer of the stomach, when we all can well put mechanical devices aside and only make use of the simplest and best and most surgical method of establishing intestinal anastomosis,—namely, with the help

of needle and thread. But this time, I fancy, will come in a rather roundabout way only. It will never come, unless we surgeons have first succeeded in thoroughly demonstrating to the general practitioner that even in remarkably emaciated patients surgery can still bring help; that even cases with multiple metastasis within the abdomen do recover from the operation, and gain in weight and strength and moral courage. This time, I fear, will never come, unless the general practitioner has repeatedly seen that his patients, previously starving to death under his eyes, are enabled by the operation to return to his care after two or at the latest three weeks from the surgeon's hand, sometimes for many months of treatment equally satisfactory to patient and physician, and that although after months many of these patients must pass away by the effect of the continuous existence of the original disease, most of them die without ever again having been troubled by a single attack of vomiting. That such successful operating can be best accomplished in the majority of these cases with the help of Murphy's button, I am fully convinced. I am also certain that if of two equally good surgeons, operating on equally cachectic patients the one does all his gastro-enterostomies for carcinoma of the stomach with the help of the button and the other only with needle and thread, then he who uses the button will have a smaller percentage of deaths through the operation, and will bestow the benefit of the anastomosis on more patients than the one who refuses to work with the button. The same holds good for pylorectomy for cancer. If favorable personal statistics of gastro-enterostomy, more yet of pylorectomy, for cancer come from all quarters of the globe; if the exploratory incision, which is still so often a mere autopsy *in vivo*, becomes less frequent, and a far-reaching beneficial effect is oftener than now the result of our operations in malignant disease of the stomach, then the general practitioner will gain more confidence in these operations than he has today; then he will consider the recovery of his patient in the surgeon's hands to be the rule rather than the exception; then he will, I hope, at last begin to send these cases to the

surgeon as soon as he has made the diagnosis or probable diagnosis. And then, if we can operate at a sufficiently *early* stage of the disease, we may indeed dispense with Murphy's button. It will be of little difference *then*, whether the operation last ten to twenty minutes longer or not.

Of course, I do not lose sight of the necessity that in order to get so far the progress in medical and chemical research must first give us the means to diagnosticate the presence of gastric carcinoma in its incipiency. If this were accomplished—and why should it not be accomplished soon?—cancer of the pylorus may as well be considered a curable disease as cancer of the breast may now be so regarded by making use of improved methods of operation.

The advantages of Murphy's button in carrying out gastro-enterostomy are so striking and manifold that I ask your kind permission to enumerate them here very briefly, although they are well known to every one of you.

(1) The anastomosis is made very rapidly. Six to eight minutes is the time generally used for this purpose. There is no surgeon living who can work equally quick with the suture. I am sure that almost every surgeon who used the button in gastro-enterostomy for the first time has been struck by the rapidity and simplicity of the method. If he had properly timed his work, the difference in comparing the time used with the button with that consumed in applying the suture, must have been at least ten to twelve minutes, often more. If surgeons should have been unable to save time in doing gastro-enterostomy with the button, the observation simply means: lack of experience in handling the ingenious instrument. To insert the button properly and rapidly, requires practical experience as every other method.

That the saving of time is of very great importance in gastro-enterostomy for malignant disease on extremely cachectic patients, that here really every minute counts, I have mentioned above at length. It is true, the actual time for properly finishing the anastomosis with the button has been somewhat increased lately, since it has been found advisable

in gastro-enterostomy to add a continuous Lembert suture, or a number of interrupted Lembert stitches, around the seat of approximation. In gastro-enterostomy I deem this suture very essential, and would strongly advise to add it in every case of this operation.[16] My patient No. 5 died from perforative peritonitis. Had I taken the little trouble and used five minutes longer in applying the suture, I do not see why my patient should not have recovered. Patient had reached the bed with a pulse of 84. The operation went on without an accident, and the usual asepsis had been preserved. Every one of the authors mentioned above favors this additional suture in gastro-enterostomy as an important safe-guard. Of thirty-nine patients mentioned above, in whom additional sutures were put in after the insertion of the button, twenty-nine recovered and ten died. Of course, the additional suture as such did not save the patient's life. But in none of the ten cases that succumbed was the cause of death perforation at the seat of approximation with consecutive septic peritonitis.

Murphy himself was in 1895 still opposed to it. In No. 3 of his conclusions[17] he says, "A supporting suture outside of the button is not necessary, except for the relief of tension." In the text of this chapter, he has thus expressed himself, "A few interrupted sutures, half an inch from the button, between the intestines and stomach may be necessary when there is great traction of the coil of intestine approximated, but I have so far not found a case in which I considered it indicated." This tension or traction seems to me is present in almost every case of gastro-enterostomy, especially if we operate according to Woelfler's method. I prefer the continuous suture. It should never be inserted right at the edge of the button, but one-third to one-half inch away from it. This can be well done, if we approximate the surface of the stomach and intestine nearest the button with our left hand, or in case of great tension by the two hands of the assistant. In this way the button is really buried. It makes, then, no difference whether the necrosis of the ring of tissue of the intestine grasped by the button sets in earlier than that of the stomach.

We also need not worry that the wall of the coil of intestine, which had been brought up to the stomach, might be subjected to undue pressure by the button. The wide approximation of serous surfaces around the button prevents leakage with absolute certainty.

(2) The patient can be fed by mouth as soon as he has recovered from the anæsthetic. Perhaps the same could be done when the suture had been used, yet so far no surgeon ever dared to do so.

(3) The anastomosis does not contract.

It has been demonstrated by a great number of autopsies that the opening does contract, sometimes materially, if the approximation had been made with the suture or its substitutes formerly devised. This contraction is the necessary consequence of physiological tissue-repair. We therefore make, in using the suture, an anastomosis of at least three to four inches in length. The button, however, cuts out by necrosis that portion of the tissue which is otherwise held in permanent approximation by the suture or its former substitutes. This hole is as large as the diameter of the button; it is sharp and round as if punched with the forceps. Three years ago I demonstrated before this society a specimen removed from patient No. 2 (see above list) eleven weeks after the operation. The anastomosis was even a little larger than the button.[18] In this case an additional Lembert suture had not been made. Whether this latter will favor contraction has yet to be seen. So far reports do not point in this direction. Graff cites a case, where the additional sutures had been put in. Six months and a half after the operation, at the autopsy "the communication between stomach and jejunum was thorough and wide." The patient in whom I performed pylorectomy for benign stricture, February 24, 1894, and implanted the duodenum in the posterior wall of the stomach, is perfectly well to-day. She has gained seventy pounds and has no trouble whatever.[19] I am certain that if the anastomosis wherever it is made with the button can carry out the function for which its establishment had been planned, it does

not contract. If contraction does occur in an uncomplicated case, it has to be looked upon as an exception.[20]

(4) On account of the small space needed in order to insert the button gastro-enterostomy can still be carried out, where the operation with the suture is a technical impossibility.

My case, No. 8, nicely illustrates this point, which deserves to be emphasized. Its real existence will be recognized by the surgeon in special cases during the operation.

There seems to be only one drawback to the use of the button in gastro-enterostomy,[21]—viz., it often drops into the stomach.

The first case recorded in literature where this accident had happened, as proved by the autopsy, is my second case on the above list. As mentioned before, I advised on this ground, in 1894, always to use von Hacker's operation when feasible. But also in this position, the button does not always follow the current of the gastric contents. In the three cases of posterior gastro-enterostomy, reported by Frey, the button was voided. In Czerny's five cases, all done according to von Hacker, the button passed four times between the eighth and eighteenth day. Once it had not been found after three and a half weeks. The patient, however, had not complained at any moment; was perfectly well when he left the hospital. There is no reason to assume that the button had slipped into the stomach. In Kuemmel's six cases of posterior gastro-enterostomy the button was not found in a single case. But it could be demonstrated by subsequent post-mortem examination, respectively by subsequent operation (pylorectomy after primary gastro-enterostomy), that the button had left its place and was *not* in the stomach nor in the intestinal tract. Kuemmel concludes, I think with propriety, "that we ought to be cautious in assuming that the button had entered the stomach, if its passage *per vias naturaes* had not been noted." Often the button may have passed unobserved, embedded in hard fæcal masses, sometimes it is retained in the ampulla recti for many months without causing symptoms (necessity of digital ex-

ploration!). Continuation of the gastric trouble (pain, etc.) will be due rather to the existence of the original disease than to the presence of the foreign body. In the future, the X-rays will help us to find out whether the button is within the stomach. I repeatedly looked with the fluoroscope through my patient No. 7, who had not had pain after the operation for a single moment, but could not find the button. An exposure of fifty minutes to the rays proved it to be within the fundus of the stomach. The accompanying plate, reproduced from this skiagraph, shows the button in the region of the fundus.[22] (Fig. 1.) The negative presents it much more clearly.

In five of my cases, which can be utilized for this question, the button had dropped into the stomach three times, as proved by the autopsy and the X-rays. In two other cases it had not been found in the stool during the three or four weeks the patient had stayed at the hospital. Woelfler's operation had been done in each case.

Among eight surviving cases reported by Graff, the button passed once on the twenty-first day after the operation, in another case on the thirty-fourth day; in five cases it did not pass within thirty-two to sixty days of hospital observation. In one patient it was found within the stomach at the autopsy, six and a half months after the operation. In all these cases also Woefler's operation had been performed.

In twelve patients, who are mentioned in the above given table and had been observed a sufficiently long time, the button passed twice per anum after the anterior operation and twice after the posterior one; four times it was found within the stomach,—viz., three times after the anterior operation and once after the posterior one; in four patients the discharge of the button had not been noticed during the time of observation. The analysis of these thirty-nine cases seems to prove that the posterior attachment of the intestinal coil greatly favors the passage of the button per anum.

That the button ever finds an exit through the anastomosis after it has once dropped into the stomach, I do not believe. On account of its weight the button always rests at

the most dependent spot of the stomach. It will roll around according to the latter's work and the position of the patient. If Woelfler's operation had been performed, the anastomosis would be made the lowest spot only with the patient lying on his stomach. The approximation, done according to von Hacker, will be more favorable to a later exit of the button. With the patient on his back, the anastomosis certainly is quite often the most dependent place. Still, it seems to me, there is little chance for a discharge of the button. If the stomach be empty, there is lack of the necessary *vis a tergo;* the instrument is too small to be grasped by the gastric wall and pushed forward. If the stomach be full, the button may often reach the hole, embedded in a mass of compact food. But then the diameter of this mass is too large. The softer material will slowly pass on, the button is retained.

It is to be regretted that the authors do not mention whether they fastened the edges of the divided mesocolon, after having drawn them apart, with a few stitches to the posterior wall of the stomach when doing the posterior gastro-enterostomy. If this be not done, the wound in the mesocolon will contract. Although it will allow the passage of fluid, it may easily hold back a foreign body of the size of the button, and will force its entrance into the stomach by retrograde peristalsis.

The interesting point in this accident, observed by all authors, is that the presence of the button within the stomach has never caused any trouble, except a rather short subjective one in my case. The mucous lining of the stomach had not been found affected at the autopsy in a single instance.

Still I consider this point a sufficient reason to do the operation for benign stricture of the pylorus with the suture. Although we know that the button does not do harm within months of its presence within the stomach, yet we cannot say what it might do there after many years. In these patients, the element of saving time during the operation is generally of less importance. We also find sufficient room to make a four-inch anastomosis.

Still another point induces me not to use the button in gastro-enterostomy for benign stricture,—viz., the great thickness of the gastric wall, which we are apt to encounter. The malignant pyloric obstruction develops rather rapidly, generally within months. After a short time surgical help is indicated. The muscularis almost always has not had time to become materially hypertrophied. This is different in cases of benign stricture. My last patient, in whom I made use of the suture, operated upon January 5, 1897, waited fully four years after the first appearance of gastric trouble, and three years after a doctor had strongly advised an operation, before she could make up her mind to submit to surgical interference. At the operation the wall of the stomach was found to be more than half an inch thick. The muscularis alone measured fully three-eighths of an inch and the mucosa was as thick as ordinary paste-board. It would have been simply impossible to have the half of the button inserted. In another case of this kind, operated upon with the suture October 22, 1896, the wall was less hypertrophied. My first case of gastro-enterostomy performed with the suture, December 31, 1888, was done for cancer. In none of the eight cases of malignant pyloric stenosis reported above, did I have special trouble in tying the button in place.

With reference to the operation itself, a few points may be worth mentioning. Thorough preparation, if possible, for at least one to two days in weak patients is very valuable. I prefer stimulation per rectum (seven ounces of saline solution, or peptonized milk with somatose, egg, etc., with one ounce of brandy, whiskey, or claret, and one-fifteenth or one-thirtieth of strychnine every four to six hours) besides the fluids the patient can still take by mouth. On the day of the operation the stomach is washed twice, early in the morning and half an hour before the operation. The operating field is carefully disinfected *before* the patient is put on the table. Mixed narcosis is used, morphine (hypodermic, one-fourth to one-eighth grain, thirty minutes before the operation) and chloroform (administered very cautiously

drop by drop, after previous cocainization of the nostrils). In weak patients narcosis is stopped as soon as the peritoneum is opened. In very weak patients the operation is done under cocaine (Schleich). The incision runs from about one inch below the xiphoid process down to the umbilicus. If more room be needed, it is continued around the umbilicus. Within the abdomen the rule is to handle the bowels as little as possible. I therefore do not deem Kocher's method[23] a good one, who grasps a coil in the pelvis and lets it slip through the fingers until he reaches the duodenum. If he happens to do the latter, the procedure may be sometimes short. But if he had first travelled down over the fifteen feet of small intestines towards the ileo-cæcal valve, he has to return the entire distance, and then proceed to the duodenum. In all my cases I found it time-saving and always easy to lift omentum and transverse colon out of the abdominal wound, and by pushing the small intestines towards the right of the patient, to see the plica duodeno-jejunalis and see and feel that part of the duodenum which is attached to the spinal column. (See Fig. 3[24].) This having been found, the fingers glide rapidly down to a spot of the jejunum, the mesentery of which is sufficiently long, to allow of its being lifted over transverse colon and omentum, and then being attached to the anterior wall of the stomach with the least tension. This is a very essential point in Woelfler's operation. If we do von Hacker's, the work is simpler. The coil adherent to the spinal column with its proximal end is the one fit for anastomosis.[25] The parts lifted out of the abdomen (omentum and transverse colon) are left in place (not returned as in Woelfler's operation), the mesocolon is bluntly divided in a spot, free of blood-vessels, its borders drawn apart, fastened to the stomach by a few stitches (Fig. 4), and now the two halves of the button are inserted.

For this purpose the portion of the jejunum is emptied with the fingers, and kept empty by intestinal clamps (or assistant's hands), or strips of gauze, a piece of silk or catgut pushed through the mesentery. The clamps are pushed over the convexity of the gut down towards the mesentery. The

one nearest the pylorus is always left on the left side of the patient's abdomen, the distant clamp on the right side. By this means, the direction of the gut from above downward is always easily recognized. Now the operative field is well surrounded with sterile gauze and the running suture put in place on the jejunum. The male half of the button is inserted and tied in. The central hole in the button is tempo-

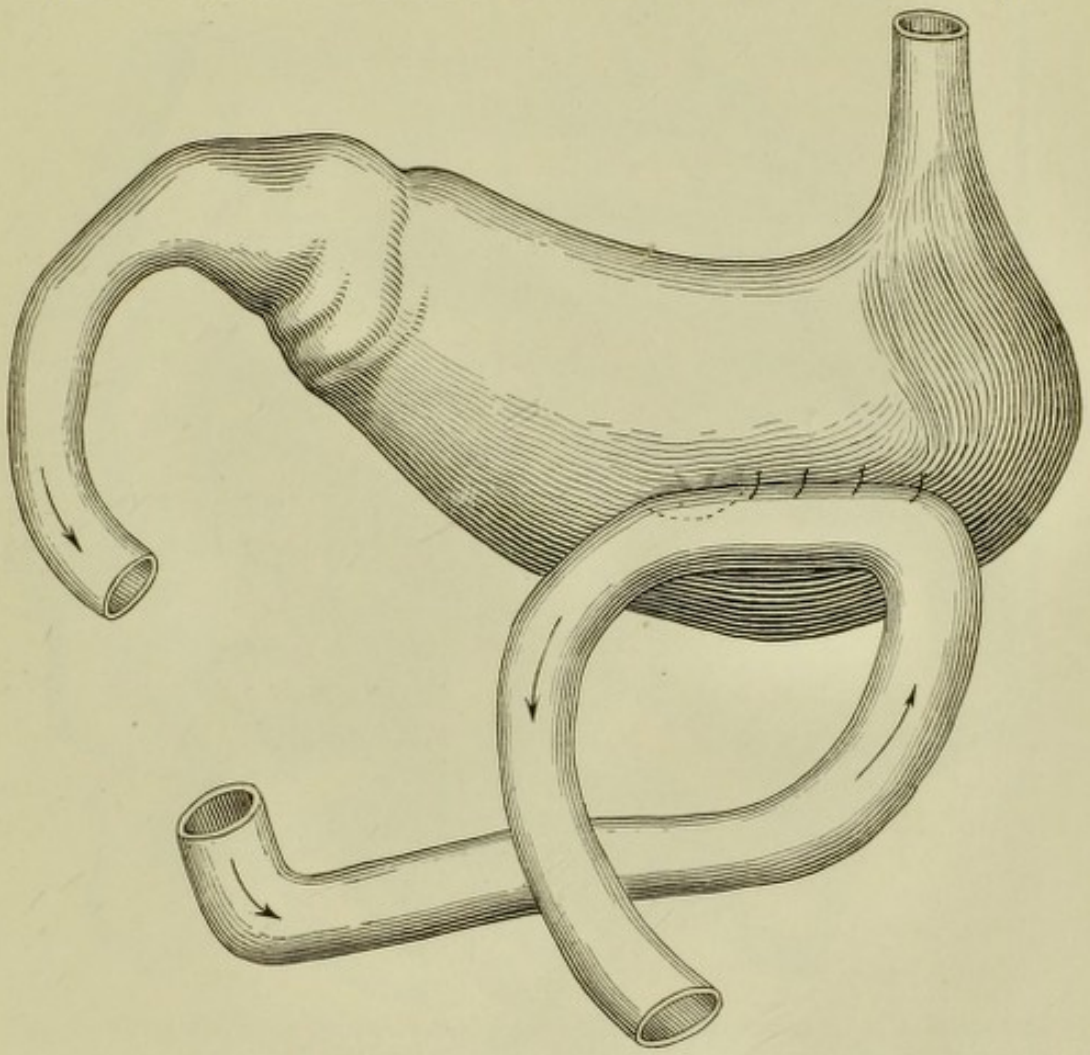

FIG. 2.—Woelfler's operation for anterior gastro-enterostomy. Three to four inches of the proximal end of the gut are stitched to the stomach by a few interrupted sutures.

rarily packed with gauze to prevent the escape of intestinal fluid. In Woelfler's operation it is covered by a large abdominal gauze-sponge, the coil of intestine having been drawn in front of the abdominal wound. In Hamburg they first incise gut or stomach and then place the purse-string suture. This enables one to catch the mucous membrane as closely to the wound as possible, and prevents its protrusion. If the run-

ning suture be primarily inserted, one must pay attention that before closing the button the mucosa is thoroughly pushed back into the cup of the instrument. If it be too redundant and projecting, the prolapse has to be clipped off with the scissors. Now the running suture is put in place in the

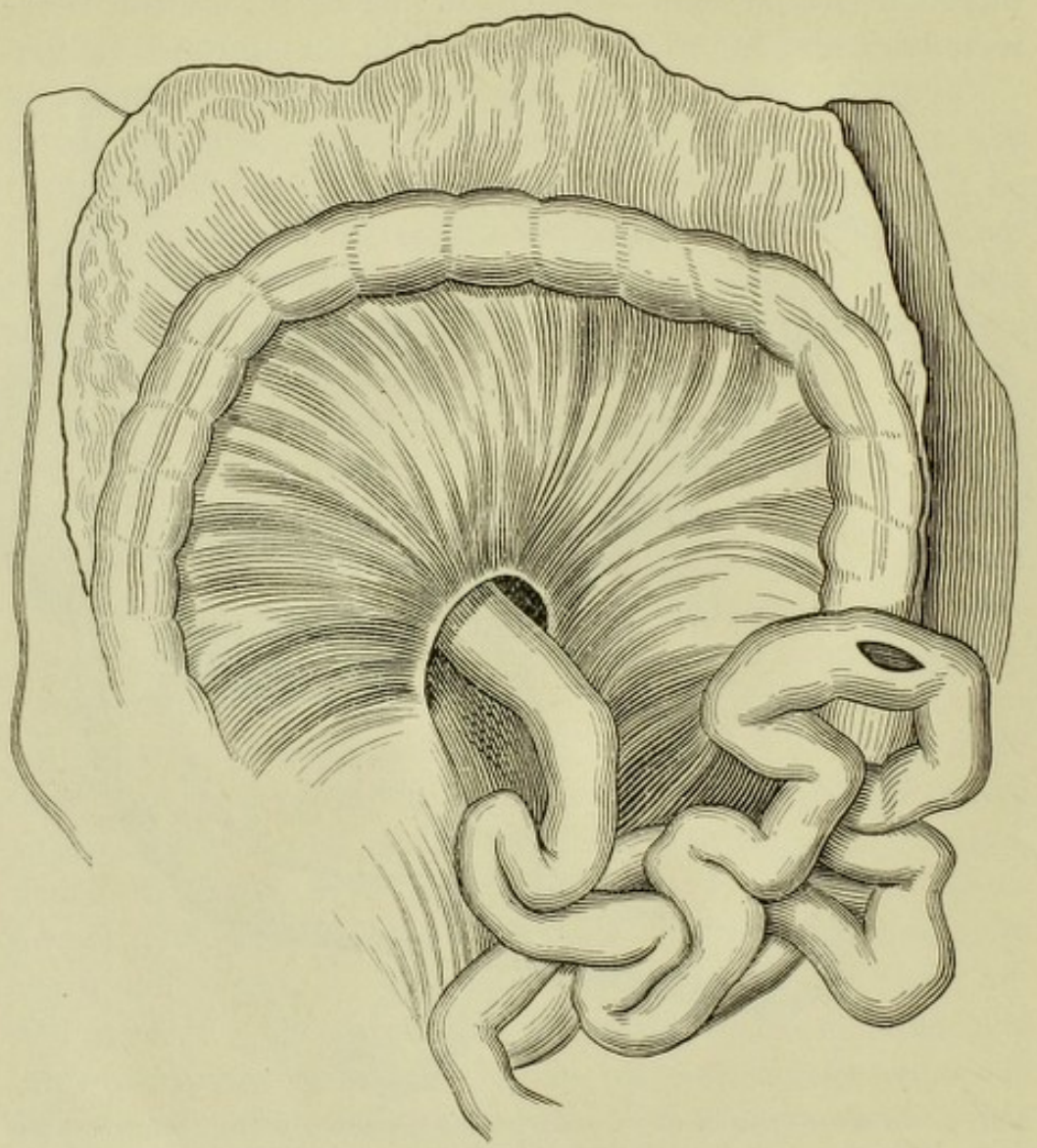

FIG. 3.—Plica duodeno-jejunalis; transverse colon and omentum, turned up to show the plica duodeno-jejunalis.

gastric wall, the incision made within the line of the suture, and the other half of the button passed through the incision and tied into the stomach. The two halves of the button are then pushed together. For the stomach I always take the longer female half, because of the thickness of the gastric

wall. I do not believe that the greater weight of one of the halves influences the direction of the button, when it has become loose. As soon as pressed together the two halves make an entirety. Only if the circular necrosis should progress unequally instead of being uniform and be finished on one side of the circumference sooner than on the other, if,

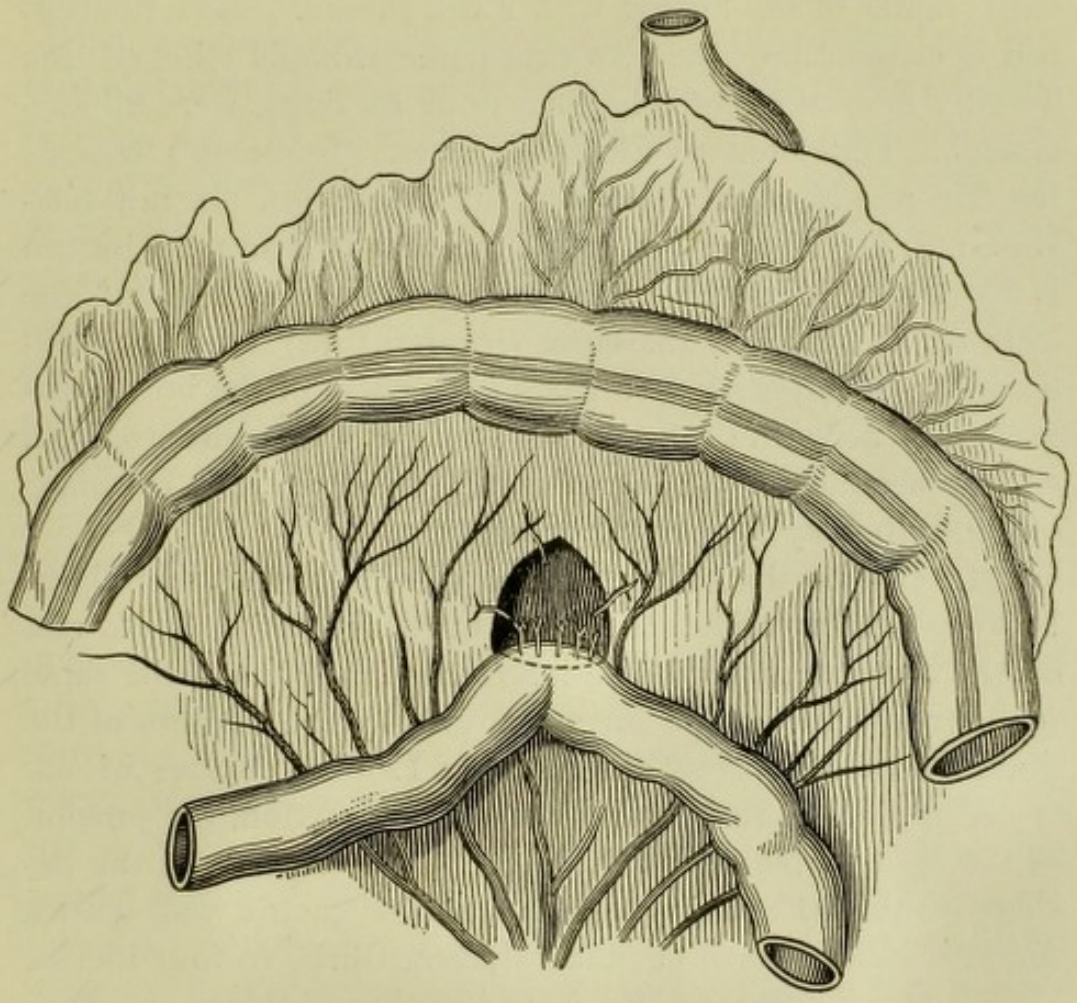

FIG. 4.—Von Hacker's operation for posterior gastro-enterostomy. The wound is bluntly made in the mesocolon, is drawn apart, and its edges fastened to the posterior wall of the stomach, before the anastomosis is established.

in other words, the button would be suspended within the anastomosis on a shred of tissue (which also tears off at last) between the seventh to tenth day, then perhaps a difference in weight of its upper and lower, of anterior or posterior side might have some bearing.

The modification lately proposed by Jonnesco,[26] I deem entirely superfluous. He cuts into the stomach and intes-

tines by a one inch incision, and through this hole introduces and presses the half of the button, which is held by a forceps against the wall from within outward. Down upon the central canal, thus well marked, he makes a short cross incision, and then presses the stem through the wall. The edges of this wound are caught by a purse-string suture of silk or tied on the cylinder of the button with a silk thread. Now the button is closed and the two first-made wounds stitched up. Twenty operations of this kind, done on dogs, were all successful. Time: ten to fifteen minutes. Jonnesco's reasons for this modification, which in my estimation are not relevant, are: (1) The incision made in order to insert the button is too large; a special suture to retain the part around the stem of the button is therefore required. (2) It is often difficult, if not impossible, to press both parts of the button together, on account of the thickness of the wall of the stomach, also on account of the risk of injuring the tissue in the clasp of the button by too strong pressure.

In closing the button, one ought to press rather tight. For this manipulation the fingers of the operator should rest on the circumference of the instrument, not inside the same (danger of injuring the intestinal wall by the borders of the drainage holes). Now the running Lembert suture of silk is put in place. At last, in Woelfler's operation, the portion of the jejunum nearest the clamp, on the left side of the patient (proximal end), is fastened to the gastric wall with a few silk sutures for a distance of about three to four inches. This favors the flow of bile as well as that of the gastric contents into the distal end,—in other words, prevents the very annoying entrance of too much bile into the stomach, and that of the food into the proximal end of the implanted jejunum. Fig. 4 ([27].) These few sutures should never be omitted. They are for the patient's future condition of paramount importance. I am prone to believe that the symptoms of the so-called "kinking of the gut" after gastro-enterostomy are often due to the omission of these sutures. In none of my eleven cases of gastro-enterostomy (ten by Woelfler's, one by von Hacker's method) did I have this annoying acci-

dent during the after-treatment; in none did I observe a persistent flow of bile into the stomach.

Now sponges and gauze are removed, the parts carefully wiped off with a gauze-sponge, soaked in sterile salt solution, and the abdomen closed. For this latter procedure I prefer braided silk (No. 8), and grasp the entire thickness of the abdominal parietes. The sutures are one-half inch apart. The silk sutures are especially necessary in the board-like hardness of the abdominal wall in the emaciated male. Here buried sutures, layer by layer, are impossible, except one first puts in four to five silver-wire retention-sutures. In female patients, who have borne children, buried sutures with catgut may be made, but never without a few retention-sutures of silkworm gut, silk, or silver wire. After the operation, feeding by mouth is begun as soon as the patient has recovered from the anæsthesia. Rectal stimulation is also again resorted to if necessary, assisted by subcutaneous stimulating injections. So far I have not needed intravenous saline infusions of 1500 cubic centimetres two to three times daily within the first forty-eight to seventy-two hours, as recommended by Kuemmel. All my patients reached their bed with a good pulse. In case of vomiting on the second or third day of larger, thin, darkish-brown, or green masses, regurgitated from the upper portion of the jejunum, lavage of the stomach is the best remedy. I use it always after the second attack of vomiting, and, when through with the same, throw a solution of a tablespoonful of Epsom salts dissolved in two ounces of warm water into the stomach. This rapidly passes the central canal of the button and moves the bowels. In aseptic wound-healing, the vomiting generally ceases after the first evacuation of the bowels.

Summing up I would say,—

(1) For gastro-enterostomy Murphy's anastomosis button is the best artificial contrivance up to date. It hastens and simplifies the operation; it enables the patient to be fed through the mouth right after the operation; the anastomosis is still feasible with its help where proper suturing is impossible. We can thus still do the operation successfully with

the button where otherwise we should have to abandon the same when only using needle and thread. The anastomosis made with it does not contract.

(2) In using the button, posterior gastro-enterostomy (von Hacker's operation) is preferable to the anterior one (Woelfler's), because it favors the progress of the button towards the anus. In both methods, however, the button can drop into the stomach.

(3) The presence of the button within the stomach has so far never done actual harm. This accident is therefore not to be considered a drawback to the use of the button.

(4) In all cases where reduction of time of the operation is of importance the use of the button is indicated and not the suture.

(5) There is no reason borne out by practical experience which should prevent us from making use of the advantages of the button in every case of gastro-enterostomy for malignant disease.

(6) If the button be used, great emaciation of the patient is no more a contraindication to this operation than it is to gastrostomy in cancer of the œsophagus.

(7) On account of the possible entrance of the button into the stomach, gastro-enterostomy in cases of benign stricture of the pylorus should be done with the help of the suture.

REFERENCES.

[1] I believe that this metastatic growth, as well as those in Case VII, have to be explained as caused by direct inoculation (grafting) from a tumor which is situated farther up in the alimentary canal. *Cf.* Kraske, "Ueber die Entstehung sekundärer Krebsgeschwülste durch Impfung," Centralblatt für Chirurgie, 1884, No. 48, p. 801.

[2] Cases I and II have been published in Centralblatt für Chirurgie, 1894, No. 52.

[3] I did not see this condition personally. It was so reported to me by a member of the house staff, who had made the post mortem.

[4] Button presents itself very clearly on the negative with a central hole.

[5] Bruns's Beiträge zur klinische Chirurgie, Vol. XIV, 1895.

[6] Centralblatt für Chirurgie, 1894, No. 52.

[7] Verhandlungen der Deutschen Gesellschaft für Chirurgie, 1896, I, p. 94.

[8] Langenbeck's Archiv, Vol. LII, 2te Heft, p. 251.

[9] Langenbeck's Archiv, Vol. LIII, Ite Heft, p. 87.

[10] Berliner klinische Wochenschrift, 1896, No. 20, p. 443.

[11] Contribution à l'Étude de la Gastro-Entérostomie avec le Bouton de Murphy. Paris, G. Steinheil, 1895.

[12] Mentioned in Dr. Murphy's latest tabulation (privat'e communication).

[13] Duvivier, loc. cit.

[14] Analysis of Cases operated upon with the Aid of the Murphy Button up to the Present Time. [15] Loc. cit.

[16] In entero-anastomosis, between the smaller intestines, I am rather inclined to follow Murphy's urgent advice and abstain from putting in additional sutures.

[17] Loc. cit., p. 277.

[18] W. J. Mayo found "the opening much larger than the button at the end of the second week after the operation. Patient had died from aspiration pneumonia," ANNALS OF SURGERY, 1895, Vol. XXI, p. 39.

[19] Patient was demonstrated before the New York Surgical Society, March 10, 1897.

[20] Dr. W. G. Le Boutillier, of New York, has observed such an exceptional contraction in a man, aged sixty-four years, on whom he had done gastro-enterostomy with Murphy's button for malignant pyloric stenosis, June 13, 1896. To my regret his report reached me too late to enter the foregoing table of twenty-five cases. After the operation the patient vomited almost daily, sometimes very large quantities of dark-colored matter, also of blood. At the post mortem, nineteen weeks after the operation, there was found "band of omentum adherent to brim of pelvis; small intestines collapsed. About two feet of intestines immediately after anastomosis, with stomach much thickened and congested. Stomach enormously dilated with fluid food; pylorus occluded. Opening from stomach into intestine much contracted, barely one-quarter of an inch in diameter, but patulous." In reading this report, one is impressed that during life there might probably have been some kind of obstruction two feet below the anastomosis.

[21] Obstruction of the central canal by pits of grapes (Villard, Curtis), or by that of a plum (Keen), can be avoided by preliminary, thorough, and repeated lavage of the stomach, and by preventing patients from partaking of fruit soon after the operation.

[22] Patient has now a burned wound of the third degree, of the size of about the palm of the hand, on his back, corresponding to the fundus of the stomach. He had been put very close to the tube for the examination with the fluoroscope, but for a few minutes only. This picture had been taken with the patient on his back. Three weeks before he had been photographed lying on his stomach. I almost believe that this rather long (forty-five minutes) first exposure caused the burn. It is known to-day that a slough, due to the X-rays, is very slowly pushed off.

[23] Operative Surgery, second edition, p. 140.

[24] Figs. 2 and 3 have been taken from Chirurgische Technik, by Von Esmarch and Kowalzig.

[25] Kuemmel takes a coil on the left side of the spinal column and then makes the posterior anastomosis. I believe it will always be a good thing, first to examine the upper part of the jejunum. In two of my patients a number of circular metastatic growths surrounded the upper part of the jejunum for almost two feet. Of course, I had to select a spot below this region for inserting the button.

[26] Th. Jonnesco (Bucharest), "Un nouveau Procédé pour l'Application du Bouton de Murphy," reported in Centralblatt für Chirurgie, 1897, Vol. VII, p. 199.

[27] Woelfler lately takes pains to attach the proximal end of the jejunum to the stomach somewhat above the anastomosis. (Von Frey, loc. cit.)