GASTROJEJUNO-COLIC FISTULA

A Report of Two Cases With Recovery

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CASE I

A man, 45 years of age, presented himself at the Clinic on July 21, 1931, complaining of "stomach trouble." He stated that 11 years previously he had first noted epigastric, gnawing pain, which came on from one to three hours after eating. During the night he would be awakened by the same type of pain, which was always relieved by eating, by alkalies and by drinking milk. He had been on Sippey diet several times by the advice of various physicians, and six years before, he had received medical treatment for "ulcer" for one month at Lakeside Hospital. He was comfortable while under medical treatment but the pain recurred as soon as he discontinued the Sippey diet. Becoming discouraged with medical treatment he sought surgical relief and was admitted to Charity Hospital in September, 1929, where I first saw him on Dr. C. A. Hamann's service. The patient was then complaining of this same type of pain, of the "belching of considerable gas" and at times of nausea without vomiting. The preoperative diagnosis was duodenal ulcer.

He was operated upon by Dr. Hamann who made the following note: "There is a marked indurated ulcer right at the pylorus, adherent to the under surface of the liver and gall bladder. There is quite a mass, very firm to touch. No stones in the gall bladder. It was thought best not to separate it from the gall bladder and liver. One or two stitches across the pylorus were put in. A posterior short-looped gastroenterostomy was done. Appendix normal, not removed, postoperative diagnosis, duodenal ulcer."

Convalescence was uneventful, the patient was placed on a Sippey diet and left the hospital twelve days after operation.

Three months later he returned to work, having been symptom free in the interim. Soon afterwards, about nineteen months before he entered the Clinic, there was a recurrence of epigastric pain, which, as before, was relieved by eating and by alkalies. The pain was accompanied by intermittent attacks of vague, cramplike pain in the mid-lower abdominal region. These attacks lasted from a few days to a week; they usually were not relieved by eating but were somewhat relieved by the "belching of gas." The patient volunteered the information that four and one-half months after his operation an x-ray examination had revealed an ulcer at the site of the gastroenterostomy. One year previously he had vomited a considerable

amount of bright-colored blood, followed by a tarry stool. Weakness and anorexia had been progressive and he had lost 15 pounds in the past few weeks. For three weeks he had had a severe diarrhea, with several bowel movements daily, one a half-hour after each meal, and although there was no vomiting, fecal or otherwise, he had had very foul eructations. He recalled having seen undigested food in his stools but there was no melena.

The personal history was irrelevant. The physical examination gave the following findings: the patient was a short, asthenic man, weighing 125 pounds. The pulse rate was 70, the blood pressure 100–40. The teeth were dirty and carious, with pyorrhea alveolaris. There was no pathological condition of the heart or lungs; the abdomen was scaphoid in contour; there was a scar four inches long over the upper right rectus muscle; the muscles were slightly weak but no hernia was present; although there was no rigidity or spasm the patient was unable to relax the abdomen completely. Slight tenderness was present in the epigastrium and there was a feeling of resistance although no tumor masses were palpable; the liver and kidneys were not palpable, the spleen was not enlarged.

Genito-urinary, rectal and gross neurological examinations gave negative findings.

Laboratory data — Urinalysis, Kahn, and Wassermann tests gave negative findings; red blood cell count, 4,430,000, white blood cell count, 8100, hemoglobin, 94 per cent; blood sugar 112 mg. per 100 c.c.; blood urea 42, mg. per 100 c.c.; urea clearance: 95 per cent the first hour and 125 per cent the second hour.

Dr. Hartsock, of the Medical Division, made a clinical diagnosis of "gastrocolic fistula" which was confirmed by x-ray examination. The barium meal passed directly from the mid-portion of the stomach into the transverse colon. The barium enema filled the stomach through the communication with the transverse colon.

Operation was advised and the patient was admitted to the hospital July 23, 1931. He was placed on a Sippey diet, and given 2000 c.c. of 10 per cent glucose intravenously daily.

Operation, under spinal anesthesia, was performed on July 27, 1931, by T. E. Jones. A gastrojejuno-colic fistula resulting from a marginal ulcer was found at the site of the old posterior gastroenterostomy together with a separate jejunal ulcer about one and one-half centimeters in diameter on the mesenteric aspect, just opposite the stoma. The fistula was excised, the opening in the colon closed, the jejunal ulcer was resected and the distal end of the jejunum was sutured to the opening in the stomach thus forming a new gastroenterostomy. The proximal jejunum was then sutured

to the distal segment of the jejunum after an opening had been made in the latter about two inches below the gastroenterostomy, forming an end-to-side jejuno-jejunostomy. This completed the so-called "en-Y" operation of Roux. The patient was immediately given a transfusion of 500 c.c. of whole blood and returned to his room in good condition. Postoperative treatment consisted of the Alonzo-Clark routine, a subcutaneous saline infusion — 2000 c.c., once daily, and an intravenous infusion of 10 per cent glucose, 1000 c.c., twice daily. On the fifth postoperative day the patient was placed on a surgical Sippey routine. Up to this time an intranasal catheter had been left in the stomach for drainage. For the first four days the temperature was constantly above 101.3° F. having reached 104° F. the evening of the first day. However, the patient's course was practically uneventful, a normal temperature being maintained from the seventh day on. The wound healed well and on the eighth day the bowel movements were normal. The patient was discharged in good condition on the seventeenth day.

He has been on four hourly Sippey feedings and when he recently returned to the Clinic for a check-up he was symptom-free. In the three and one-half months since he left the hospital he had gained 20 pounds. A recheck of the gastrointestinal tract while revealing a rapidly emptying gastroenterostomy gave otherwise negative findings. It is impossible to predict the ultimate result in this case for not enough time has elapsed to make a definite statement regarding the prognosis. The results are satisfactory thus far.

Case II

A man, 57 years of age, came to the Clinic on June 3, 1927, complaining of "pain in the right side." He stated that he had been well up to the age of 28 when he began having intermittent pain in the right abdomen accompanied by vomiting. In 1905 the right kidney had been anchored, and the appendix and gall bladder removed. He had relief for one year only. In 1915 he was operated upon and an old duodenal ulcer was found for which a posterior gastroenterostomy was performed. Again he obtained relief for but one year. In 1921 an exploratory operation was performed, and "the redundant portion of the stomach sutured." In 1926 a stone was removed from the left ureter. There had been no recurrence of symptoms of ureteral stone.

Ever since his last operation which was performed eight months previous to his admission to the Clinic, the patient had complained of severe pain in the upper abdomen particularly on the right side, vomiting of bile and of yellow, thin material that was bitter, and no food. Vomiting gave considerable relief. The stools had been normal

in color but there had been a tendency to loose stools. This condition had been particularly aggravated by the use of alkalies which gave slight relief from the pain. There was no loss of weight.

The physical examination gave the following findings: weight 130 pounds, temperature 99.2 degrees F., pulse rate 100, blood pressure 160–110. The skin was sallow and the mucous membranes showed a suggestion of cyanosis. The upper teeth were all missing, and the remaining lower teeth were dirty. Nothing abnormal was found in the heart or lungs.

Abdominal examination revealed bilateral lumbar scars, a McBurney's scar and two right rectus scars. Tenderness was present over the upper abdomen and an indefinite mass could be palpated in the right upper quadrant. The inguinal rings were bilaterally relaxed and the prostate was slightly enlarged.

The clinical diagnosis included postoperative adhesions, dilatation of the common duct with retention of bile, relaxed inguinal rings, and hypertension.

The laboratory findings were as follows:

Urinalysis gave negative findings except for a very faint trace of albumen. Red blood cell count, 4,460,000, white blood cell count, 9550, hemoglobin 75 to 80 per cent, Kahn and Wassermann tests gave negative findings, blood sugar 112 mg. per 100 c.c. (two hours postprandial) blood urea 39 mg. per 100 c.c.

The roentgenographic findings were: Gastrointestinal series gave the following findings: nothing abnormal in the plain gall bladder plates, the duodenum was deformed by adhesions and showed slight retention. The gastroenterostomy did not function; the colon showed a constant filling defect, the lumen being narrowed in the transverse portion just under the scar of the "gall bladder lap," this was not a typical picture of carcinoma; all the abdominal anatomy was quite altered by the surgical operations that had been performed.

Nothing abnormal was found on the K.U.B. films.

The patient was seen in consultation by Drs. Crile, Lower, and Phillips, who agreed that medical treatment was indicated rather than surgery. A Sippey diet and alkaline powders were prescribed and the patient was sent home to be under the care of his home physician.

He returned to the Clinic three months later stating that he had had a persistent diarrhea for a month, with five to six stools a day. There was no blood in the stools, but considerable gas and mucus was passed and for two nights there had been incontinence of the bowels. For the past two days he had had a "griping pain" in

the lower abdomen, and a persistence of the right upper abdominal pain. He still had lost no weight.

A second x-ray examination gave the following findings: The stoma functioned normally, the stomach being empty at the end of five hours. A small portion of the barium passed through the small intestines but the greater portion passed directly into the transverse colon just distal to the hepatic flexure via a fistulous opening between the jejunum and transverse colon. The stomach was easily filled with barium by means of a barium enema. The x-ray diagnosis was gastrojejuno-colic fistula.

The patient again returned home to be under the care of his physician. He was placed on a Sippey diet, and was given large doses of bismuth, but grew progressively worse. He returned to the Clinic four months later, with the same complaints of persistently severe diarrhea, progressive anorexia, nausea, vomiting and weakness, having lost 25 pounds in weight during the four months. Surgical treatment was advised and he was admitted to the hospital on January 3, 1928.

The laboratory data were as follows: x-ray recheck of the colon showed the stomach filled by the barium enema. Red blood cell count 4,040,000, hemoglobin 60 per cent. Urinalysis gave negative findings. Fasting blood sugar 68 mg. per 100 c.c., fasting blood urea, 30 mg. per 100 c.c.

The patient was given frequent small feedings and his diet was increased; the fluid intake was kept up and as a result he was free from nausea and vomiting. On January 12th, nine days after entering the hospital he was operated upon by Dr. W. E. Lower. An old gastric resection was found. The fistula was located at the site of the posterior gastroenterostomy. The gastroenterostomy was opened, the thickened portion of the stomach about it resected, and the opening in the stomach closed. A new posterior gastroenterostomy was made and about three inches of the transverse colon, including the fistulous tract, was resected. An end-to-end anastomosis of the transverse colon completed the operation. A transfusion of 500 c.c. of whole blood was given immediately after the operation.

The patient was placed on the Alonzo-Clark routine for four days, after which the fluid intake was gradually increased. Each day saline was given by hypodermoclysis, and glucose was administered intravenously. On the seventh day, however, an attack of coughing caused the abdominal wound to become separated, and secondary suturing was necessary. On the same day the patient received a second blood transfusion and his course was uneventful

thereafter; the wound granulated well and the patient left the hospital on the twenty-third postoperative day.

A Sippey regimen with alkaline powders was prescribed. Convalescence was rapid at home; the patient gained twenty-five pounds in two weeks, and 42 pounds in six months.

The patient returned to the Clinic about two months before this report, presenting no symptoms referable to the gastrointestinal tract but complaining of symptoms of hypertension which had lately developed.

Review of the Literature

Previous to 1903 about 70 cases of gastrocolic fistula had been reported in the literature, all of which were the result of carcinoma of the stomach or colon. In 1903 Czerny[1] reported the first case of gastrocolic fistula following gastroenterostomy and since then 124 similar cases have been reported. In all, there have been reported over 250 cases of all types of gastrocolic fistula resulting from organic diseases of the stomach and colon, such as carcinoma, trauma, etc. The incidence of the type due to carcinoma is increasing with the increasing frequency of operations.

In 1924 Verbrugge,[2] of the Mayo Clinic, in a study of all cases of gastro-colic fistula, collected 202 cases from the literature, seven of these being from the Mayo Clinic. He added 14 more cases bringing the total to 216. Of the 21 cases reported from the Mayo Clinic, two resulted from carcinoma of the transverse colon, and 19 from jejunal ulcers following gastroenterostomy; seven of these cases were not diagnosed either clinically or by x-ray, 14 cases were diagnosed by x-ray and 13 cases were diagnosed clinically, one being doubtful. Of the 216 cases reviewed by Verbrugge, 95 cases resulted from posterior gastroenterostomy, and 121 cases from organic lesions of the stomach and colon, chiefly carcinoma.

In May, 1931, Wiese[3] reviewed 119 cases in which a gastrocolic fistula had followed gastroenterostomy and added two of his own; however, in his report, he did not include one case reported by Gatewood[4] and two cases reported by Hübscher.[5] In 1912 Haudek[6] made the first roentgenologic diagnosis of gastrocolic fistula but Burnham[7] in 1917 was the first to report a case of gastro-colic fistula diagnosed by the x-ray. In all cases reported since 1924, including the two cases reported herein, the condition has been either diagnosed or confirmed by x-ray.

Loewy[8] in a series of 63 cases, reported a mortality of 27 per cent, and 62 per cent cures, with definite recurrences, however, in 11.1 per cent.

Etiology — Gastro-colic fistulae are due to the perforation of gastrojejunal ulcers. This was found to be the case in from two to five per cent of the cases of gastrojejunal ulcer found in the United States. The Mayo Clinic reports an incidence of 11.36 per cent. In similar analyses, Bolton and Trotter[9] report an incidence of 10 per cent, and Lion and Moreau[10] report an incidence of 12 per cent. In the German literature the incidence is placed somewhere between 5 and 10 per cent.

In 1929 Katzoglu[11] collected from the literature 117 cases of gastrojejuno-colic fistula following gastroenterostomy and added two of his own. He suggests the restoration of normal channels as a means of lowering the mortality which is given as 20 per cent.

The factors which account for the development of gastrojejuno-colic fistulae are the same as those which account for the origin of the marginal ulcer, namely, the following:

1. Carelessness in postoperative management.
2. Causes similar to those of the original peptic ulcer.
3. The use of unabsorbable sutures. However, several authors deny this.
4. Trauma of the mucosa at operation.
5. Position and inadequate patency of the stoma.

Symptomatology

The symptoms of gastro-colic fistula vary in degree and in accordance with the size and directness of the fistula. The most constant and frequent symptom, and the first to appear, is the eructation of foul gas.

Diarrhea is usually present and is an important factor in the diagnosis. This symptom was absent, however, in two cases reported by Monroe and Emery.[12]

Pain is a variable symptom. It is sometimes marked, as the result of localized peritonitis, or it may be almost absent; in fact, the pain from the ulcer not uncommonly disappears after the development of the fistula.

Loss of weight is usually marked, with a correspondingly increasing weakness. The appetite may remain good.

Vomiting may occur. Frequently when the diarrhea is checked fecal vomiting results. The vomitus may not be fecal, however. Anemia is present with little or no apparent loss of blood.

Several cases have been reported in which marked edema was present. This is undoubtedly due to a nutritional disturbance either from lack of food, or from non-absorption due to the gastrointestinal disturbance. Even with an adequate mixed diet, as long

as there is a "short circuiting of the small intestine," the food is not absorbed and consequently, there is a presistent edema. No apparent cause has been found for the edema in the cases in which autopsy has been done, but the condition is probably due to a disturbance of the blood protein.

The physical examination usually reveals localized tenderness and a palpable mass in the region of the fistula, anemia and emaciation, and sometimes edema.

The *diagnosis* is usually made from the history. It is extremely important to make an x-ray examination in each case in which diarrhea develops following a posterior gastroenterostomy. The vomitus should be examined as well as the stools, and although a fluoroscopic examination of the stomach is of diagnostic value it is easier to distinguish the fistula by means of a barium enema. Every case of gastrocolic fistula can be diagnosed by x-ray examination. Dyes may be used and the excretion of substances given by mouth may be timed. There is no record of any cases in which spontaneous healing occurred, many cases having gone on for long periods without operation.

Treatment

Once the diagnosis has been established, operation is indicated as soon as the condition of the patient warrants it. Blood transfusions without limit should be employed in the far advanced cases and in any case in which there is a disturbance of serum protein fractions. The type of operation depends entirely on what is found when the abdomen is opened. Balfour recommends pylorisection to prevent recurrence.

Good postoperative management is most essential. To obtain the best results, accurate dietary management should be instituted.

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