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GASTRORRHAPHY.

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*CASE. Atonic Dilatation of the Stomach.*—C. W. S., male, fisherman, aged forty-seven years, Gloucester, Mass. Ward VII; bed 9. Entered Massachusetts General Hospital in care of Dr. F. C. Shattuck, January 18, 1897.

*Family History.* Mother died of heart disease.

*Habits.* No alcohol; no tobacco. Denies venereal.

*Personal History.* Usual children's diseases. Measles at twenty-four. "Slow fever" at nineteen for three months. No cough.

*Present Illness.* Beginning in 1883, he had once a year periods of vomiting, with nausea and inability to retain food on the stomach. These lasted for a week to two months and kept him from work. Attack preceded several days by gastric distress and water-brash. Would usually lose 20 to 30 pounds, which was quickly regained after stomach symptoms subsided. Each attack was worse in severity and duration than the one preceding it. For the last five years attacks have come twice a year and usually lasted a month. A year ago he was ill three months, and lost 40 pounds in weight, which returned in the next two months. He was in very good health after this until last May, when the old trouble again set in. Since then he has vomited daily, and pain and distress in stomach have increased. A few weeks ago, while out in a fishing-schooner, vomitus for a fortnight was like coffee-grounds. From that time he has done practically no work, but is not in bed. Recently, as a rule, he is comfortable during the day, but toward evening is taken with a gnawing pain in the epigastrium which gradually increases until he vomits in the middle of the night.

Then pain gradually wears away. Vomitus varies in quantity from a pint to a gallon, yellow or dark colored, very sour-smelling, often containing undigested food. Patient has marked constipation; he may have no movement for a week. Stools are occasionally black and tarry; usually not. He has eructations of gas and acids. Borboryg-mus. His appetite is fair. His best weight is 200 pounds; he now weighs 148 pounds.

*Physical Examination.* Large skeleton; cheek bones prominent. Pupils react. Tongue pale, flabby, heavily coated. Pulse strong, voluminous, and forcible. Lungs negative. Heart, small area of dulness; no murmurs. Liver, fifth rib, no edge felt. Inguinal glands of good size. Epitrochlear glands enlarged. Knee-jerks active. Stomach tympany. No tumor felt.

*Urine.* Normal color, alkaline, 1018.5; no sugar; no albumin; no diazo reaction. Sediment heavy; amorphous phosphates.

*Blood.* Reds, 3,536,000; whites, 9400. Hæmoglobin, 48 per cent. Liquids and soft solids.

*January 19th.* Last night was much distressed, but did not vomit. This evening vomited thirty-seven ounces of yellow fluid. Vomitus contained HCl. Digestion, leucocytosis present. 1 P.M. meal; whites 9550, 4.30 A.M. whites 12,800; gain of 3250.

*20th.* House diet, with care. Liquids limited to one pint daily. Stomach washed after test-meal. Capacity 3000 c.cm. HCl present; lactic present in small amount. When inflated, lower border nearly reaches pubes.

*21st.* Stomach washed every morning before breakfast.

*22d.* Residue before washing, ten ounces

*23d.* Residue before washing, three ounces.

*24th.* Residue before washing, twelve ounces.

*25th.* Residue before washing, thirteen ounces.

*27th.* Residue before washing, none. Vomited in night.

*29th.* Residue before washing, eighteen ounces.

*30th.* Residue before washing, twenty-seven ounces.

*31st.* Residue before washing, nineteen ounces.

In evening, sodium bicarbonate for distress in stomach. Has not made much difference. Feels quite comfortable and has an appetite.

*February 2d.* In morning, one-half ounce magnesia sulphate (sat. sol.).

*3d.* Seen by Dr. Porter in consultation. He agrees with Dr. Shattuck that an operation is worth the risk. Patient wishes to con-

sult his family regarding it. Discharged relieved; to return in case of decision in favor of operation.

*Copy of Hospital Surgical Records.*

February 15, 1897. Patient entered the surgical ward for operation. History as above, copied from medical records. Temperature 98.4°. Pulse 76 Respiration 18.

16th. Urine: albumin, none; sugar, none; pale, acid, 1027. Vomitus: HCl present; lactic absent.

17th. Case examined by Dr. Shattuck again. Stomach washed out. Dilatation same as before. No pyloric stenosis made out. Prepared for operation.

18th. Stomach washed out in morning. Washings clear, slight greenish tinge. Previous to operation given an enema, consisting of two ounces of salt solution, one ounce of brandy, one-twenty-fifth of a grain of strychnia; white of egg. Transferred to Ward E.

*Operation.* (Dr. Porter. Ether.) Incision along border of ribs on left side, which reached from middle line just below ensiform cartilage to angle of ribs. Bleeding points tied with silk, and peritoneal cavity opened. Hand was introduced and stomach found immediately below incision. Pylorus palpated, and thickened mass felt in connection with it. Stomach pulled up to the incision. Some adhesions about pylorus and some about cardiac end made this very difficult. Stomach wall very slippery, and could scarcely be held, except with gauze, on account of the violent muscular contraction stimulated by manipulation. When stomach was finally pulled out pylorus was again explored. The thickened mass was apparently behind the pylorus, and not a stricture or growth about the pylorus. Few enlarged glands found. One, size of large bean, removed from the omentum; was examined immediately by Dr. Whitney and pronounced non-malignant, simply hyperplastic. As there was some doubt about mass near pylorus, an incision was made through anterior wall of stomach, which was somewhat thickened. Index finger was introduced easily through pylorus, the mass lying behind and not connected with it. The incision in stomach was closed by two rows of catgut sutures through the mucous and muscular walls, and a third row of Lembert silk sutures in the peritoneum; surface washed off with sterile water, and the gauzes which had been placed about this part of the stomach before the in-

cision, changed, the cardiac end of the stomach pulled down as much as possible, and one or two Lembert sutures placed in such a way that when drawn tight a part of the wall would be folded in. This was accomplished by making the space between the places where the suture passed into the wall of the stomach as wide as possible. Few similar sutures then placed about the middle of the greater curvature. The pyloric end of the stomach was then pulled up as far as possible and similar sutures passed. These were to be used as guides, and were so placed that when tied they would bring the line of the greater curvature as high up toward the lesser curvature as possible—perhaps one and one-half to two inches below. These guide-sutures were then tied, and the fold thus made was held invaginated while its edges were caught all the way along by a row of interrupted Lembert sutures. Holding the stomach during the last part of the operation was extremely difficult, as its muscular contraction seemed to have been excited by the manipulations. After the suturing stomach was allowed to retract into the abdominal cavity. No bleeding. Incision closed by double headers of silk through peritoneum, muscle, and fascia, and by a continuous silk stitch in the skin. Dressing, swathe. In good condition.

Incision below ribs. Pylorus explored by finger through incision in anterior wall of stomach. No stricture. Anterior wall invaginated and sutured. Gastrorrhaphy. Abdominal wall sutured in two layers.

As soon as in bed, enema. Coffee, brandy  $\bar{a}\bar{a}$   $\bar{z}$ ij; salt ad. one pint. During afternoon, subcut. strychnia, gr.  $\frac{1}{40}$ . Visited by Dr. Porter in late afternoon, who ordered morphia, gr.  $\frac{1}{8}$  by subcut. Patient to have absolutely nothing by mouth. Enema every six hours. Beef juice, peptonized milk  $\bar{z}$ j, egg albumin  $\bar{z}$ j, whiskey, and salt sol.  $\bar{a}\bar{a}$   $\bar{z}$ ss. Suds and glycerine enema every morning to clean out rectum.

19<sup>th</sup>. Urine: first after ether, albumin, none; sugar, none; 1025; acid; slight increase in color. Morphia gr.  $\frac{1}{4}$  subcut. last night. Patient fairly comfortable. Whiskey omitted from enemata, as pulse good. Chloral gr. xv, bromide gr. xx in night enema.

20<sup>th</sup>. Complains of feeling nervous, otherwise doing nicely. Has had no vomiting since operation, not even during recovery from ether. Spits up a little today. Morphia gr.  $\frac{1}{8}$  subcut. and bromide gr. xxx at 9 P.M. Enema. Seen in the evening. As patient seems to have lost ground a little, decided to start with mouth-feeding. (Food by mouth second day after operation.)  $\bar{z}$ ss doses every half hour of either albumin-water, beef-juice, whiskey, soda-water, black coffee.

Enemata every three hours, beef-juice, peptonized milk, salt solution,  $\bar{a}\bar{a}$   $\bar{\zeta}$ ij.

21st. Took nourishment well during night. Nauseated but slightly on two occasions. This morning doses increased to  $\bar{\zeta}$ j every half-hour. Did not retain the 9 A.M. enema. Enemata discontinued on two occasions, and after that to contain laudanum  $\mu$ v. Dressing done this morning. Incision looked well. Moist corrosive dressing.

22d. Had trional gr. xx. last night for sleeplessness. No nausea. This morning, 9 o'clock, enema, not retained. Twelve o'clock enema omitted, and nutritives to be continued only every six hours. In the evening, whiskey, and beef-juice omitted.

23d. During the night feeding gradually increased, so that this morning patient is getting  $\bar{\zeta}$ ij of liquids every hour.

24th. For a short time has been spitting up yellow extremely foul smelling sputum. Seen to-day by Dr. Shattuck, who finds trouble in bases of both lungs behind. Dulness and whispered bronchophony. Whiskey  $\bar{\zeta}$ j every three hours. Abdominal wound looks all right. Codeia gr.  $\frac{1}{8}$  every four hours p. r. n. for cough.

26th. Nine days after operation, says he feels 70 per cent. better today. Expectoration about the only thing of which he complains. Scrambled eggs and scraped beef added to diet list. Liquids increased to  $\bar{\zeta}$ ij every hour.

27th. Ten days after operation, examined by Dr. Shattuck, who finds bronchial breathing in bases of both backs more marked on right than left. Raw oysters and gruels added to diet list. Sputum has become dark-colored, rusty.

March 1st. Temperature subnormal in morning, quite high in evening. Whiskey increased to  $\bar{\zeta}$ iss every three hours. Dip toast; rice boiled; thin Irish moss blanc mange added to list according to patient's taste; blood: whites, 14,100.

2d. Urine: albumin, very slight trace; sugar none; 1027; acid; no bile; color high. Few polynuclear cells; small medium-sized round cells. Occasional blood globules. One or two dubious hyaline casts.

3d. Sputum decreasing somewhat in amount; still rusty. Dr. Shattuck finds that consolidation is unchanged. Whiskey increased to  $\bar{\zeta}$ ij every three hours. Some distinctly bloody expectoration. Blood, 4 P.M.: whites, 23,900.

4th. Temperature going up. For some days evident that pulse steadily rising. Today probable that patient will die. Codeia

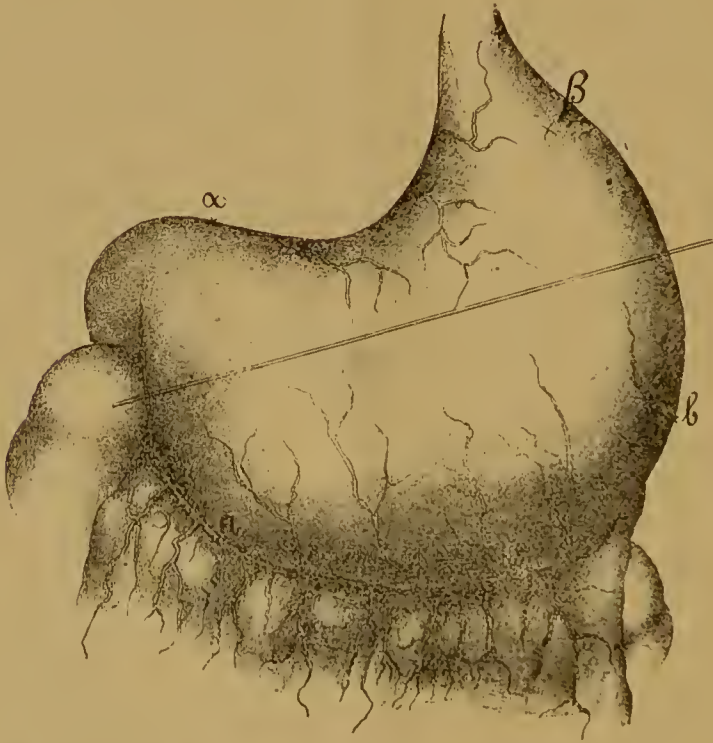
omitted. Sol. morphia  $\text{ʒss}$  every four hours to keep patient comfortable. In the evening oxygen begun. Strychnia by subcut., later gr.  $\frac{1}{60}$  every three hours, which later was increased to gr.  $\frac{1}{30}$ . Expectoration had decreased in amount.

5th. Patient fairly comfortable. Died at 10.40 A.M., fifteen days after operation. The pictures illustrating the steps of the operation are copied from Bircher from *Correspondenz Blatt für Schweizer Aertze*, vol. xxii.

There are a few interesting points to be noticed in this case:

1. He died from a septic process in the lungs, yet his stomach was washed out before operation. He did not vomit at all in recovering from ether or subsequently.

FIG. 1.

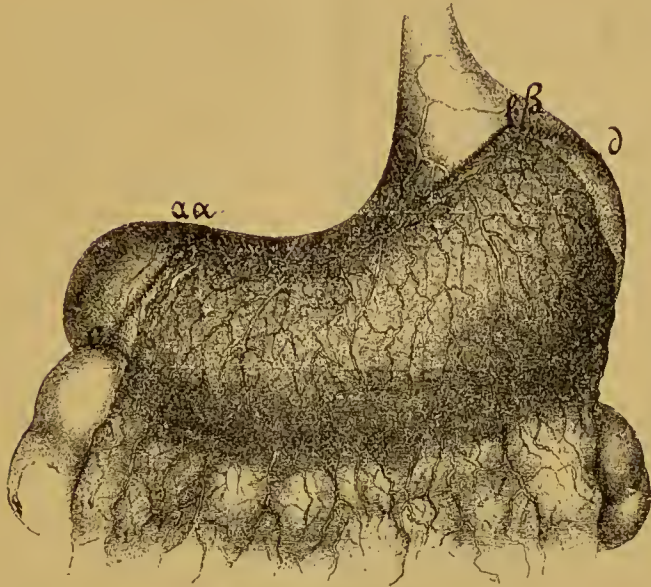


Dilated stomach, showing line of fold; *a* to be sutured to *a* and *b* to *b* with intermediate sutures.

2. Food was given by the mouth on second day after operation and retained and digested. For more than a week prior to death the stomach was doing excellent work.

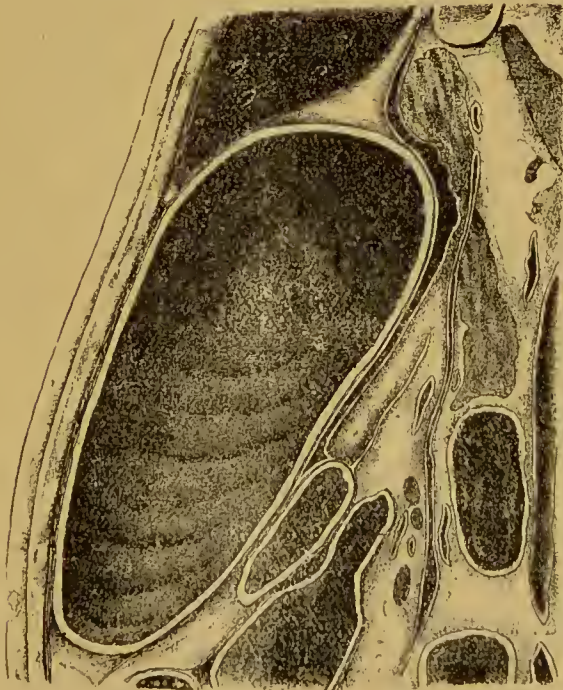


FIG. 2.



Operation completed.

FIG. 3.

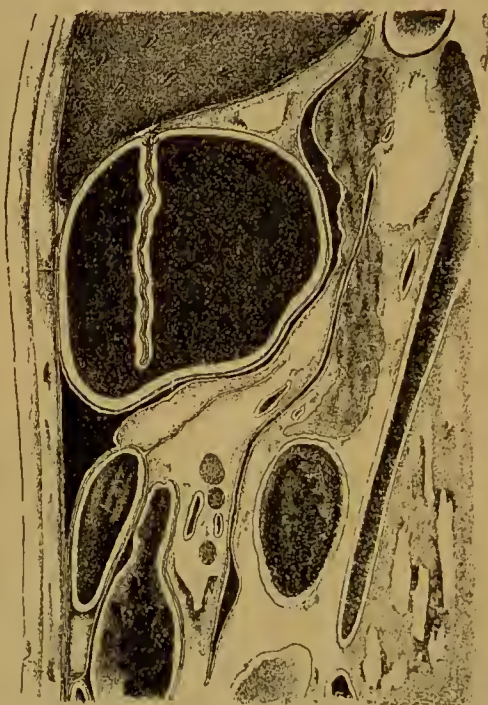


Vertical section of dilated stomach.

The patient was so poorly nourished before operation that I think he would have failed rapidly had nutritive enemata been alone relied upon for nourishment for six days, as in previous cases.

Lastly, the abdominal wound was entirely healed and the case a success from that standpoint, the septic process not having its origin from the wounds of the abdominal or stomach-wall.

FIG. 4.



Vertical section of stomach after operation, showing infolded wall.

*Autopsy.* (James H. Wright, M.D., March 5, 1897) Only those conditions copied which concern the operation field and the cause of death. Abdominal wound apparently completely healed. Some adhesions of omentum in neighborhood. Peritoneal cavity free from fluid. Intestines, especially colon in its upper portions, widely distended with gas. Serosa of intestine smooth and shining. No injection.

*Stomach* adherent to liver and to diaphragm by a thick fibrinous exudate. The lesser peritoneal cavity not obliterated.

*Liver* adherent to diaphragm by fibrinous-like strings. In the neighborhood of gall-bladder, old adhesions with colon.

In *anterior wall of stomach* there is a row of sutures along the long axis of the organ, 13 cm. long. Near pylorus a second row of sutures about 3 cm. long. No evidence of suppuration. No escape of gas or fluid on pressure.

In both *thoracic cavities* a very small amount of fluid containing yellowish shreds.

*Lungs: Left lung.* Superior lobe extremely pale; on section contains a moderate amount of a frothy, slightly reddish fluid. Inferior lobe largely collapsed. The inferior portion, over an area corresponding perhaps to one-quarter of the lobe near pleura, is broken down into dirty, grayish, stinking, diffuent material, rather sharply marked out from lung tissue in neighborhood.

The pleura of the inferior lobe and of the posterior inferior portion of the superior lobe covered with a fibrinous exudate, which in places is yellow, several millimetres thick, elastic, and infiltrated with fluid. The pleura in these situations firmly adherent to visceral pleura, on which a similar exudation is present, most marked over the diaphragm, apparently opposite to the gangrenous area of the lower lobe. Just beneath the parietal pleura, near the junction of the lower ribs with the spinal column, there is a half-dollar sized flattened elevation with circular outline covered with fibrinous exudate and on section composed of a red-black material resembling clotted blood. There was no perforation of diaphragm. The fibrinous exudate of pleura in places on the lung shows numerous minute vessels extending into it from the pleura.

*Right lung.* In superior lobe a chestnut-sized area just beneath the pleura in which the lung-tissue is broken down into a brownish-gray, diffuent, stinking material, rather sharply marked out from surrounding lung-tissue. In inferior lobe on pleura are two circular areas covered with a dirty yellowish-gray exudate, rather sharply defined and varying in size from a half-dollar to a dollar. These circular areas seem to correspond to similar circular yellow elevations beneath the parietal pleura, which on section, are made up of a dirty gray, diffuent, purulent-looking, necrotic material. They are situated in the posterior portion of the thoracic wall. A rib passing beneath one of them was excised and gave no evidence of suppuration in the intercostal or osseous tissue beneath. The areas on the pleura correspond to extensive areas of lung-tissue transformed into a brownish-gray, stinking, diffuent, gangrenous material. The areas are sharply marked off from surrounding lung-tissue. The inferior lobe is markedly col-

lapsed, its pleura and the pleura of the posterior and inferior portions of the upper lobe covered with a fibrinous exudate which in places is yellow, thick, and infiltrated with fluid. In lower lobe there is apparently some consolidation in the neighborhood of one of these gangrenous areas, the tissue being resistant, grayish, and homogeneous. The pulmonary arteries leading to the inferior lobes of both lungs were dissected, but no good evidence of embolism could be made out. Bronchi infected and contain a considerable amount of a dirty, grayish, opaque fluid.

*Stomach.* The long row of sutures corresponds to the infolding of the stomach wall, the short row to a wound in the stomach wall with inversion of the edges and coaptation of the serous edges. At the pylorus there is a distinct loss of substance in the mucous membrane in the form of an oval ulcer, 5 cm. long by 2 cm. wide, and perhaps 4 or 5 mm. deep. The margins smooth, to a considerable extent undermined, and the mucosa projecting over. The floor fairly smooth, with three to four polypoid projections. The edge of the ulcer reaches to within 1 or 2 mm. of the pylorus. The tissue in the neighborhood of the ulcer not especially indurated, nor is the stomach wall especially thickened about it. The pylorus admits the index finger. The stomach, as it appears with the plait in its wall, is of moderately large dimensions. The stomach-contents show no evidence of hemorrhage. The mucosa not remarkable.

*Anatomical Diagnosis.* Ulcus ventriculi, with dilatation of stomach. Gastrorrhaphy; gastrotomy. Circumscribed fibrinous peritonitis. Gangrene of lungs. Fibrinous pleuritis. Acute degeneration of kidneys. Chronic prostatitis.

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