A CASE OF GASTRO-ENTEROSTOMY,

TOGETHER WITH A

TABLE OF THE CASES HITHERTO RECORDED.

BY

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Received March 9th—Read May 14th, 1889.

If we may judge from the number of published cases, it would appear that the operation of gastro-enterostomy which was first undertaken by Woelfler in 1881 has been performed but seldom in this country. The reasons for this are not very obvious, for the operation has met with considerable and increasing success, and there can be no question that it is capable of bringing relief from the distressing symptoms incidental to pyloric occlusion in those cases where pylorotomy is not feasible, and of making the close of life more comfortable, free alike from vomiting and pain. It is my intention to give a short account of a case which was under the care of Dr. Lees and myself in St. Mary's Hospital at the beginning of last year, and then more especially to examine the cases which have been already published, and which I have brought together in the accompanying Table, in the hope that we may form some critical estimate of the operation, its dangers and its results, and secondly of eliciting from other surgeons their opinion as to its real value and prospects.

H. M—, æt. 48, a railway porter, was admitted into St. Mary's Hospital, on November 19th, 1887, under the care of Dr. Lees. He came of a healthy family, his father having lived to eighty-four. His own habits had been steady, and he had uniformly enjoyed good health until an attack of jaundice four years ago, from which illness in his own opinion he had never quite recovered. A year after this he was seized with obstinate, yet painless, vomiting, especially at night. He seems to have been subject to occasional vomiting ever since, but for the last six or eight weeks the sickness had become much worse, and during this time he had certainly been losing flesh; he had had to leave his work, and had been much in bed. The circulatory, respiratory, and urinary systems were all healthy, but he looked somewhat anxious and worn, and he was unquestionably thin. His spirits were good, and he was wishful to have something done for his relief. There was nothing noticeable about the abdomen, but an inch above the umbilicus there was to be felt a thick lemon-shaped lump, movable on manipulation, seemingly about four inches in length, and lying transversely across the middle line. There was no tenderness. The stomach was very decidedly dilated. The vomited matter measured a pint or more each time, was acid, with an extremely sour penetrating smell, and contained sarcinæ. On December 3rd his stomach was well washed out with warm water which brought away a large quantity of matter, so thick and sticky as often to block the tube. His weight on December 9th was 8 st. 13½ lbs.

The diagnosis of cancer of the pylorus having been made, I was asked to see him on December 14th, and the case being deemed a favorable one for operation, at any rate for exploration with a view either to pylorotomy or gastro-enterostomy, he was transferred to my care on December 19th. He weighed on that day 9 st. His stomach had been washed out twice daily since the 14th, and it was now decided, preparatory to the operation, to wash it out three times a day, the last injection on each occasion to contain ten grains of salicylate of soda. This repeated washing

clearly had great influence in altering the character of the vomited matter. A final washing was carried out on December 21st, two hours before the operation. This was begun at two o'clock, the abdominal wall having been carefully cleansed beforehand, and every precaution being taken to keep the patient warm, and to protect exposed bowel by hot aseptic cloths. Spray was not used. The abdomen having been opened by a four-inch median incision above the umbilicus, a portion of the great omentum immediately protruded. The tumour was found lying exactly across the centre of the wound. In size it was a good handful, involving the pylorus, and stretching some three inches on the anterior wall of the stomach. Behind it there was a mass of enlarged glands which pulsed over the aorta. Pylorotomy being out of the question, I proceeded at once to gastro-enterostomy, following the directions of Mr. Barker as given in the account of his successful case in the 'British Medical Journal,' February, 1886.

Very considerable difficulty and delay were experienced in getting the stomach forwards out of the wound, and also in adjusting between the fingers which held them the stomach wall and the chosen piece of bowel. This was believed to be a piece of jejunum, for it had been followed down, as I then thought, from the duodenum with the finger and so hooked forwards. The bit of bowel was easily isolated with india-rubber bands passed through the mesentery, but the strain upon it, in order to hold it in contact with the stomach was very considerable. An incision, an inch and a quarter in length was then made in the axis of both bowel and stomach, through serous and muscular coats only. From the stomach there was no bleeding, but that from the bowel was very troublesome, ligatures having to be applied after failure and much delay from pressure. The posterior edges of the divided coats of stomach and bowel having been next united by Woelfler's suture, extending half an inch beyond the incision at each end, the stomach was opened with scissors; and again there was very troublesome and rather profuse bleeding

which had to be arrested by ligatures. A small quantity of mucus alone escaped when the gut was now opened in a similar way. Without difficulty the anterior lips were then united by Czerny's suture, and this accomplished, a row of Lembert's sutures one sixth of an inch apart was placed all round, at a distance of half an inch from the incision, and at the extremities somewhat farther, so as to avoid all risks of kinking. Some sixty sutures were used, the material being the finest twisted Chinese silk, threaded on fine round sewing needles.

The elastic bands having been released, I was concerned to find that the mesentery and peritoneal covering of the bowel had been torn by the stretching in four places. Three of the rents were small, but one was an inch in length and quite exposed the muscular coat of the bowel. Each was accurately closed with Lembert's suture. Having been carefully wiped, the parts were returned into the abdomen, and there no longer seemed to be the least tension. The peritoneal cavity was finally washed out with sterilised water at a temperature of 100° F. The abdominal wound was closed in the usual way.

The man bore the operation extremely well; his pulse was good, and he was quite warm at the end of it. The operation had lasted, I am sorry to say, three hours and forty minutes, the long time it had taken having been due to several causes; to the bleeding which has been named, to the difficulty in drawing out the stomach and in adjusting it and the bowel together, and to the necessity of suturing the rents in the mesentery.

It is unnecessary to dwell at any length on the after history of the patient. He lived for ten weeks and two days, and although during this period his condition, as far as comfort was concerned, was vastly different from what it was before the operation, for he was greatly relieved from vomiting and nausea, his breath became sweet, his tongue was clean, and he enjoyed his food, yet nevertheless his weight did not increase, and it was obvious at the end of six weeks that he was losing rather than gaining ground.

From the operation he had rallied without untoward symptom or the least rise of temperature. For the first four days he was fed entirely by enema, and then began to have milk, barley-water, and brandy by the mouth. The wound was dressed for the first time on December 28th and found to be soundly healed. On December 29th he had some chicken broth and on the two following days boiled chicken in addition to milk, barley water, and Mellin's food. On January 2nd and 3rd he was troubled with vomiting, and at one time brought up as much as a pint and a half. This was relieved by washing out the stomach. Gradually he was able to take more food, but this must be said, that throughout the rest of his life any very solid food did not seem to pass readily out of the stomach. What he most liked was the chewing of underdone steak. On January 7th he sat up, and ten days later dressed himself. He had been markedly improving, was more cheerful, enjoyed his food, and was free from sickness. His diet consisted of chicken, raw steak, Brand's essence, koumiss, which he much preferred to milk, biscuits and toast, eggs, bread and butter, rice in milk. These various things he ate with almost too much enjoyment, as if he were anxious to make up for lost time. Flatulence was his chief trouble, but was efficiently relieved by a drop of creasote every four or five hours. Notwithstanding his improvement in many respects, his weight on January 19th was found to have fallen eight pounds since the operation, and this grievously depressed him. Again on February 2nd there was another fall of half a pound, although he had been seemingly doing well and had been gaining strength, as estimated by what he could do in the way of dressing himself and moving about in the ward. The middle of February saw a return, for two or three days, of the sickness, not to the same extent as before, but yet enough to distress him considerably, and he was clearly getting weaker. February 24th was his last time up, and from this day onwards he gradually sank, being quite free from pain and vomiting. He died rather suddenly on March 3rd, seventy-two days after the operation.

The necropsy was made by Mr. Silcock, who reported as follows :

Omentum strongly adherent to under surface of the wound in its whole length. The colon was much distended with gas and fluid. Only a small portion of the left lobe of the liver was visible, its anterior edge being one and a half finger's breadth below the ensiform cartilage, united with the omentum, subjacent portion of stomach, and upper extremity of the wound by tough adhesions. The transverse mesocolon was shortened, puckered, thickened, and adherent to the growth in the stomach. The coil of intestine which was attached to the stomach was a portion of the ileum nine inches from its lower end. The mesenteric glands were slightly enlarged. After removal of the stomach it was found that the viscus had to be very greatly distended before fluid was made to pass through the opening into the stomach, but no fluid could be forced through the pyloric orifice when that in the ileum was closed. When partially dilated the stomach measured eleven inches from the cardiac end to the pylorus. On opening the stomach the orifice between it and the ileum was found to be about the size of a threepenny piece, admitting the tip of the little finger. It was situated on the anterior surface of the stomach, half an inch below the point of junction of the lower edge of the left lobe of the liver with the stomach wall, and about two and a half inches to the left of the upper limit of the growth. This involved the whole of the pyloric end of the stomach, as a firm mass measuring three inches by two inches, encroaching upon the stomach in an upward direction, and adherent to the parts around. Some enlarged glands were found on the under surface of the duodenum. The other parts of the body demand no special comment.

I do not propose to give any account of the steps of this operation, gastro-enterostomy ; first of all because my own experience of it is obviously insufficient, and secondly because this has already been done, as fully and exhaustively as it could be done, in the well-known Monograph of von

Hacker, "Zur Casuistik und Statistik der Magenresectionen" ('Archiv für klin. Chir.,' 1885, Bd. xxxii, p. 616); and more recently by Dr. C. Rockwitz, "Die Gastroenterostomien an der Strassburger chirurgischen Klinik" ('Deut. Zeitschrift für Chir.,' Bd. xxv, 1887, p. 502). As a more profitable course I shall consider the table of cases, and see what lessons may be learned therefrom. Before doing so, however, I should like to refer to that which I can only regard as a blot in the case just recorded, the unfortunate circumstance that the portion of bowel attached to the stomach was at the wrong end of the small intestine, a portion of the lowest ileum instead of jejunum. It seems practically certain that the man might have lived a great deal longer had the food which left his stomach been subjected to the natural processes of digestion and absorption in the alimentary canal. As it was, his food, of which no lack was taken, did him little or no good, and the explanation of this lies in the fact recorded. Precisely the same accident has more recently befallen Lauenstein, whose name appears three times in the table of cases, ('Centrbl. für Chir.,' 1888, p. 472). Having opened the abdomen and found that pylorotomy was out of the question, he chose a piece of moderately distended small intestine lying immediately below the transverse colon, and this he sutured to the front of the stomach. The patient bore the operation perfectly, but on the fourth day began to have profuse diarrhœa, and food which had been swallowed only half an hour before was on more than one occasion found unchanged in the stools. (Case 35, Table). The woman got rapidly weaker and weaker and died on the eleventh day, and then it was found, as Lauenstein had suspected, that the opening in the gut was quite low down, 40 cm. (15 in.) in fact from the ileo-cæcal valve. The greater portion of the small intestine was empty. In one of Lauenstein's other cases (13 Appendix) the sutured piece of gut was found to be two metres below the duodenum, and in a recent case to which Senn referred at the Congress of American Physicians and Surgeons the bowel sutured

was eight feet below the pylorus. In all the remaining cases where the fact is specially mentioned the upper end of the ileum, if not the jejunum itself, had been properly joined to the stomach wall. It can only be in exceptional cases, therefore, that the piece of intestine, chosen after the manner recommended in von Hacker's Monograph, shall turn out, by an unfortunate and unusual disposition of the intestinal coils, to be something other than it was thought to be. To push the omentum aside, to feel for and follow the duodenum and then take up what seems to be a piece of jejunum is obviously insufficient and uncertain, and both Lauenstein's case and my own show that it is a matter of supreme importance to choose a high piece of small bowel.

The mode of choosing a coil is dealt with at some length by Rockwitz in his paper on gastro-enterostomy, and he comes to the conclusion that in the interests of antisepsis any prolonged search for a piece of jejunum is to be avoided, and that we should rather choose a suitable coil which can be conveniently sutured. The direction of this coil may be definitely determined, if it is so wished, by exciting reverse peristalsis by touching the bowel with common salt, after the method of Nothnagel, but it is obvious that the convenient coil eventually may turn out, to the detriment of the patient, to be at the wrong end of the small intestine. The accident has occurred twice already in a comparatively small number of cases; and as the result may be disastrous, I feel sure that the surgeon will do well, somehow or other, to make sure what portion of bowel he is going to suture. In his paper Lauenstein speaks of a large incision in the abdominal wall and more definite search for the duodeno-jejunal fold. Neither can add much, if at all, to the risks of the operation. The longer incision may be unnecessary, but the necessity of an accurate choice of bowel is unquestionable in the light of these two cases, and the surgeon must clearly not rest content with choosing the bit of gut which is merely the most convenient, or which seems to be right because it is lying just below the colon and has appeared to be continuous with the duodenum. In my

own case I felt no doubt at the time that I had got hold of the proper piece of bowel, and although it may be an unusual thing for the lower end of the ileum to be lying near the stomach, yet the possibility of it must be borne in mind, so that suture of a wrong piece may be avoided in any future operation. It would be very much better to trace the bowel up from the lower end and so make sure that that part has not been chosen, and at any part we can always determine the direction of the gut by that method of tracing the mesentery to its attachment which was originally recommended by Dr. Frank Rand. ('Lancet,' December 22nd, 1883.)

Let us now turn to the Table of Cases. These are thirty-nine in number, exclusive of two where pylorotomy and gastro-enterostomy were done at the same time, and four by Senn, to which a merely casual reference is made in the 'British Medical Journal' in an account of the recent meeting of the American Congress of Physicians and Surgeons (vol. ii, 1888, p. 1008¹), and from which no sufficient details can be gathered.

Of the thirty-nine cases of gastro-enterostomy recorded in the Table, fifteen died directly or indirectly as the consequence of the operation; directly as *e. g.* from collapse; or indirectly, as from a kink and obstruction, or from suppurative peritonitis, in the course of a few days. In endeavouring to arrive at the rate of mortality it is clearly unfair and

¹ The reference to Dr. Senn's cases is to be found in the epitome of his speech at the Congress, and is in these words:—"The author had in the past eight months performed gastro-enterostomy in four cases by this method (by means of decalcified bone plates); in all of these cases the operation was a success, although in one case the patient died because the operation had been postponed too long. In one case the advice of Lücke had been followed, and the first presenting portion of the bowel had been fastened to the stomach. The patient continued in good condition for nine days when symptoms of obstruction came on, and he died in three weeks. It was found that the connection with the bowel was eight feet below the pyloric orifice, and that the movements of the bowel had produced a sharp flexion of the intestine causing obstruction. Gastro-enterostomy in incurable carcinoma was a safe operation, and one which the surgeon owed to all such patients; it was the best operation."

misleading to regard a case as successful simply because the patient got over the immediate effects of the operation; and in counting fifteen cases as unsuccessful I have taken all the circumstances of each into careful consideration. In the post-mortem record of these fifteen cases the word peritonitis occurs seven times only, striking evidence that with proper precautions this source of danger and death may be almost certainly excluded. Exhaustion, collapse, shock, diarrhoea, continued vomiting, these are the most frequent expressions in the records of the other fatal cases, and they show what really are the chief dangers which have to be met. In other words, it is probably more a question of suitability of the particular case for operation than of special dexterity on the part of the operator. In making this remark I do not exclude my own case from my mind. Firstly, as far as age is concerned: the average age of the fatal cases was rather more than forty-six years, viz. forty-six and one third exactly, while that of the successful cases was a little over thirty-eight and a half years—no very great difference. More important in all probability is the degree of wasting and exhaustion at the time of operation. Upon this point it is impossible to speak with certainty, for the records do not enable us to draw comparisons between the several cases in these particulars. Nor is there sufficient evidence at our disposal for forming a conclusion as to the influence which the length of time spent over each operation may have had upon the result. We know enough, however, to say that prolonged exposure and anæsthesia must have a large share in determining the amount of collapse afterwards. In my own case much time was lost in arresting hæmorrhage, but even in the absence of this and of such other special circumstances as caused delay in that instance, the necessity of having to put in as many as sixty sutures in order to ensure perfect apposition and to prevent future kinking must always be a very long business. And here I think a very great improvement in the operation is likely to follow from use of the decalcified bone plates which have been introduced and recommended by Senn, and the ac-

count of which in the 'Annals of Surgery' (vol. vii, 1888, pp. 1, 99, 171, 264, 367, 421) seems to leave no doubt that approximation of bowel and gut may be thereby very much simplified, and may be finished with safety in a much shorter time. In any future operation I should feel strongly inclined to use these plates, for the numerous experiments made with them by Senn on animals bear conclusive testimony to their exceeding value. They were used by Senn himself in the four cases to which brief reference has been already made, and by Ransohoff in Case 39 of the appended Table.

The unsuccessful cases and the causes of death are as follows :

- Case 2. Vomiting and spur, fatal in ten days,
- Case 3. Exhaustion, fatal in three days.
- Case 4. Hæmorrhage and collapse, fatal in four days.
- Case 6. Fæcal vomiting, sutures gave way, fatal in two days.
- Case 8. Collapse, purulent peritonitis, fatal in four days.
- Case 9. Suppurative peritonitis, fatal in twelve days.
- Case 11. Collapse, commencing peritonitis, fatal the same day.
- Case 12. Collapse, fatal the same day.
- Case 16. Return of vomiting. Exhaustion, fatal in eighteen days.
- Case 17. Collapse, commencing peritonitis, fatal in fourteen and a half hours.
- Case 20. Collapse, commencing peritonitis, fatal in twenty-three hours.
- Case 21. Collapse, peritonitis, fatal in thirty-six hours.
- Case 22. Perforative peritonitis, fatal in twenty-four hours.
- Case 31. Kink, fatal in ten days.
- Case 35. Exhaustion. Opening too low, fatal in eleven days.

Here are fifteen cases in all, and the words collapse or exhaustion occur the most frequently. Of these fifteen cases one, No. 20, was the subject of recurrent cancer after

pylorectomy a year before, a circumstance in itself sufficient, one would think, to make the case an unfavorable one for gastro-enterostomy. Amongst the remaining fourteen, five, viz. Cases 2, 4, 22, 31, and 35, were fatal, it may be said, from unfortunate or unavoidable accidents; and of the nine others, having an average age of forty-three, Case 3 is admitted by the operator himself to have been unsuitable, "operated on too late"; Case 6 was one of very extensive disease in a man aged fifty, the pancreas being involved in the malignant mass; Case 8 had had incessant vomiting for five months, the stomach was much dilated and there was extensive disease, all indicative of great feebleness at the time of operation; Case 11 died from shock the same evening, a circumstance not explained by any data recorded, and surely most unfortunate in a man aged thirty-six, with cicatricial constriction not due to cancer; Case 12 also from early collapse after having been ill a year; Case 16 from gradual exhaustion, the patient having had constant vomiting, dilated stomach, and extensive disease; Case 17 from collapse in fourteen and a half hours; and Case 21 from collapse in thirty-six hours, the phrases "great anæmia" and "wasting" suggesting at any rate that the patient was in a very feeble condition when the operation was undertaken.

These facts only serve to show how all-important it is to undertake gastro-enterostomy in those cases only where the exhaustion from vomiting and want of food and the amount of the pyloric disease have made no very great advances. This is a self-evident truth, applicable not more to gastro-enterostomy than to many other operations in surgery.

Turn we now to the other side of the picture. First of all it is satisfactory to note that with increasing experience, with greater care perhaps in the choice of suitable cases, and in better operative methods the rate of mortality has steadily declined. Thus in the first twenty cases, with an average age of exactly forty (excluding Case 18 in which the age is not given) there were ten deaths; while in the

second nineteen cases, with an average of rather less than forty-three and a half, there were only five deaths. It is true that the numbers are few, and that the conclusion may consequently be erroneous, but the result is such as we have been wont to see in the history of other operations. In this second period fall the marvellous series of cases by Lücke of Strassburg, seven in number, all successful.

Then, moreover, if the operation may be undertaken with a fair promise of success in well-chosen cases, what do the successful cases themselves tell us may be gained by it? Not cure, it is true, but relief from the torments of starvation and incessant vomiting, and with these benefits the prolongation of life. In what mortal and irremovable disease can a patient hope for more? Take the case which has been as successful as any other in the list, that of Mr. Barker (Case 25), where the patient lived for twelve months and one week, with much comfort and fair enjoyment of life until shortly before the closing scene. On these points the Table does not speak with the fulness that could be wished, for many surgeons have published their cases without waiting for the ultimate result, and in rare instances only has this been subsequently recorded.

Look, however, at Cases 5, 10, 14, 18, 24, 25, 28, 29, 30, 32 and 36 for records of unquestionable improvement, and with the improvement who can doubt that there was in all probability prolongation of life?

I think that gastro-enterostomy is worthy of more attention in this country than has been hitherto paid to it. The recorded cases lead me to the conclusion that the operation is distinctly justifiable, and one which the surgeon may recommend with a clear conscience, provided always that the patient appreciates the risk, and understands that relief from his symptoms, not cure from his disease, can alone be given him.

Table of Cases of

No.	Surgeon.	Reference.	Sex.	Age.	Disease.	Duration and symptoms.	Date of operation.
1	Wölfler	Centrlb. für Chir., Nov. 12, 1881, p. 705	M.	38	Cancer of pylorus, size of lemon, involving ligt. hepato-duodenale and head of pancreas	Three months. Constant vomiting and loss of flesh	Sept. 28, 1881
2	Billroth	von Hacker's "Magen operationen an Prof. Billroth's Klin.," Wien, 1886, p. 64	M.	45	Cancer of pylorus, stretching along the posterior wall of the stomach and the lesser curvature in nodules almost up to the cardiac end	Four months. Vomiting, pain, constipation, wasting; epigastric tumour to be felt	Oct. 2, 1881
3	Lauenstein	C. für Chir., 1882, p. 758, and Arch. für klin. Chir., 1882, vol. xxviii, Hft. 2	M.	50	Cancer of pylorus, with much gland involvement	Six months. Failure of health and loss of 51 lbs. in $\frac{1}{2}$ year. At work up to 10 weeks before operation	Dec. 15, 1881
4	Rydygier	C. für Chir., 1883, p. 241	M.	54	Pyloric tumour, size of apple, and much involvement of stomach and glands	Two years indigestion. Latterly fluids only taken, and much vomiting suffered	May 13, 1882
5	Lücke	D. Zeitschrift für Chir., 1882, Bd. xvii, p. 573, and C. für Chir., 1882, p. 855	F.	31	Cancer of pylorus adherent to gall-bladder and head of pancreas	Six or seven months. Dilated stomach; tumour to be felt. A year before had oöphorectomy for myoma of uterus	May 25, 1882
6	Kocher	Korrespondenzbl. für Schweizer Aerzte, 1883, No. 23	M.	50	Cancer of pylorus, involving glands and neighbouring peritoneum	No data	June 5, 1882

Gastro-enterostomy.

Operation.	Result.	Remarks as to effect of operation or necropsy.	Later history.
Transverse incision 22 centimetres long a thumb's breadth above the umbilicus. A coil of small intestine united by modified Lambert suture to anterior surface of stomach, a finger's breadth above the gastrocolic ligament at the greater curvature. An opening 5 centimetres long	Recovered	Vomiting ceased at once. More fluid was taken day by day, and on the 8th day solid food; well-formed stools. On the 17th day the wound had opened from over exertion, and the abdomen had to be washed out again. After this went down hill	Died on 30th October from marasmus (von Hacker's monograph). P.M.—Union firm; opening 2 centimetres wide; tubercular ulceration of lower ileum.
Transverse incision as in Case 1. The great omentum was in the way, and a portion of it was therefore removed by the thermocautery after ligature in four places. A coil of jejunum was then sutured to front of stomach	Died in 10 days	Bilious vomiting, soon becoming faecal in odour, began the day after, and lasted till the end. P.M.—Firm union of jejunum, opening size of 6d. Vomiting explained by the formation of a spur, which had directed the bile right into the stomach, and offered impediment to the exit of food from the stomach into the distal part of the gut. Commencing pneumonia	—
Vertical incision 14 centimetres long a little to right of linea alba	Died in 3 days	No peritonitis. Piece of jejunum 45 centimetres from the lower duodenal curve	Lauenstein himself says that the operation was undertaken too late.
Prepared by salicylic washing of stomach. Vertical incision as in Case 3; catgut sutures	Died on 4th day	Did well for 3 days; then sudden pain and collapse after copious dark motion. There had been extensive hæmorrhage from the stomach. All parts healed and union sound	At the operation it had been thought sufficient to stop any bleeding by the pressure of the hands, no ligatures being used. The weakness of the patient had then reduced the bleeding to a minimum.
During the operation the stomach and bowel were kept in apposition by a clamp	Recovered	Discharged from hospital in 37 days, and by August had gained 7 lbs. No alteration in tumour	She lived 14 months after the operation in comfort, and able to attend to her household work. No necropsy.
Wölfler's	Died in 2 days	Fæcal vomiting and giving way of sutures. Necropsy partial only. Pancreas involved	—

No.	Surgeon.	Reference.	Sex.	Age.	Disease.	Duration and symptoms.	Date of operation.
7	Lauenstein	Verhandlungen der deutschen Chirurgen Congress, 1883, p. 24	F.	25	Cancer of pylorus, glued to the liver	No data	1882
8	Billroth	von Hacker's Monograph	F.	42	Cancer of pylorus, involving lig. hepato-duodenale, the lesser omentum, and the gall bladder	Constipation for many years; frequent vomiting for 5 months; dilated stomach. Tumour felt in epigastrium	Sept. 5, 1883
9	Courvoisier	C. für Chirurgie, 1883, p. 794	F.	56	Cancer of pylorus, involving glands, transverse colon, head of pancreas, and the lig. hepato-duodenale	Two years ago "catarrh of stomach." Return for last 6 weeks. Operation delayed 5 weeks after admission, as patient would not agree. No dilatation of stomach	Oct. 19, 1883
10	Rydygier	C. für Chir., 1884; Chirurgen Congress, p. 63	M.	20	Stenosis of duodenum from ulcer	Vomiting of blood and food for 4 or 5 years. Dilatation of stomach relieved by washing out. Diagnosis was ulcer of pylorus; it really was ulcer of duodenum	March 13, 1884 (?)
11	Monastyrski	C. für Chir., 1884, p. 352	M.	36	Pyloric stricture from sulphuric acid	No data	1884
12	Ransohoff	Medical News, 1884, p. 578	M.	34	Cancer of pylorus	Ill 1 year	April 12, 1884
13	Billroth	von Hacker's Monograph	M.	37	Tubercular stricture at junction of duodenum and jejunum; many glands involved	For 3 years pain in stomach, vomiting, and diarrhoea; general failure of health; stomach dilated	May 11, 1884

Operation.	Result.	Remarks as to effect of operation or necropsy.	Later history.
Wölfler's	Recovered	Symptoms of pyloric stenosis removed, but constipation continued	Died in 4 weeks from exhaustion. Piece sutured was 2 metres below the duodenum. The transverse colon had been slightly compressed.
Wölfler's. Transverse epigastric incision. Jejunum to front of stomach; opening 5 centimetres	Died in 4 days	Gradually sank. Some purulent peritoneal infiltration found of the submucous and subserous layers between the two rows of sutures. Jejunum sutured 22 centimetres below the fold	—
Transverse incision above umbilicus. The proper flexure of bowel could not be found, and therefore an opening was made in the adherent mesentery and transverse meso-colon, and a piece of intestine was then sutured to the posterior surface of the stomach near the greater curvature and 3 centimetres from the coronary artery	Died on Nov. 1	Went on well till 27th October, when symptoms of peritonitis arose, with frequent vomiting and tympanitis	Necropsy. Diffuse phlegmonous infiltration in right rectus; union of gut to stomach firm (jejunum), but in the omentum was a flat-sized stinking gaseous abscess. This case seems to be referred to by some writers as one in which the transverse colon became gangrenous from pressure.
Median incision. Piece of gut, 40 centimetres from the duodeno-jejunal curve united to greater curvature; Kürschnernaht and Lembert; opening 5 centimetres	Recovered	Steady improvement in health and strength as known for several months	Recovery from the operation somewhat delayed by small abscess in abdominal wall, and also in the parotid gland, which needed incision.
Median incision. Wölfler's; jejunum to greater curvature; catgut sutures	Died	From shock same evening. Union secured, but peritonitis beginning	—
Wölfler's	Died	In 8 hours, of collapse	No record as to what part of the gut had been opened.
Jejunum sutured to front of stomach	Recovered	In 1 month had gained about 21 lbs. in weight. One eighth day wound gave way and had to be re-sutured. After this "tuberculosis of lungs" set in, and diarrhoea	Died in rather less than 2 months. Necropsy. Extensive disease of lungs. Immediately under the wound a small suppurating cavity and some local peritonitis.

No.	Surgeon.	Reference.	Sex.	Age.	Disease.	Duration and symptoms.	Date of operation.
14	Socin	C. für Chir., 1885, p. 157	F.	43	Carcinoma of stomach	Recurrent. Pylorectomy had been performed 9 months before; rapidly increasing obstruction	June 5, 1884
15	Rydygier	C. für Chir., 1885, p. 476	M.	32	Cancer of pylorus, adherent to liver and gall-bladder	For 1 year increasing vomiting. Dilatation of stomach; no tumour to be felt	July 26, 1884
16	Lücke	D. Zeitschrift für Chirurgie, Bd. xxv, 1887, p. 511, <i>et seq.</i> paper by Rockwitz	F.	46	Cancer of pylorus, adherent to liver and pancreas	Indigestion for 5 years. Recently vomiting in large amounts; dilated stomach; constipation; tumour to be felt	Nov. 3, 1884
17	Billroth	von Hacker's Monograph	M.	33	Cancer of pylorus, adherent to pancreas and liver	For 6 months indigestion, constipation, vomiting, wasting; tumour to be felt	Dec. 10, 1884
18	Hahn	C. für Chir., 1887, Verhandlungen der deutschen Chirurgen Congress, p. 56	M.	—	Supposed cancer of pylorus	Fluids only taken in small quantities; great loss of flesh	1885
19	Billroth	von Hacker's Monograph	F.	48	Cancer of pylorus	For 6 months vomiting. Much wasting; well-marked tumour to be felt	Feb. 21, 1885
20	Billroth	Ibid.	F.	40	Recurrent cancer after pylorectomy, done on Feb. 26, 1884	At work for a time after the pylorectomy. Return of vomiting for past 3 months	Mar. 3, 1885
21	von Hacker	Ibid., and in Arch. für deutsch. Chir., xxxii, p. 623	M.	49	Cancer of pylorus. Fixed posteriorly	For 9 months constant pain and vomiting. Great wasting; patient had the delusion that a beast was in his stomach	Mar. 22, 1885

Operation.	Result.	Remarks as to effect of operation or necropsy.	Later history.
Median incision. Jejunum 30 centimetres from the fold joined to stomach. Fistula 6 centimetres long	Recovered	Was out of bed in 12 days, and in 4 months had gained 10½ lbs.	The first case in which both operations had been done. After history not published.
Wölfler's. "Kürschner-naht."	Recovered	Very favorable. Left the hospital in 37 days. Natural motion on 11th day	—
Median incision	Died in 18 days	Did well for 4 days, then vomiting returned and weakness increased. Necropsy; suture holes slightly torn by traction; transverse colon somewhat constricted by crossing gut	—
Oblique incision to right of the umbilicus	Died	In 14½ hours from collapse. Necropsy; jejunum to anterior wall of stomach; commencing peritonitis	—
Wölfler's	Recovered	Rapidly gained flesh. Patient shown two years after at the German Congress	The diagnosis of cancer doubted because of the result.
Median incision; jejunum to front of stomach; long and difficult, because of adhesions of great omentum to transverse colon	Recovered	Vomiting ceased. Gained weight, and discharged in 5 weeks	Died in 4 months. Renewed vomiting and wasting; no necropsy
Median incision; prolonged trouble from adhesions; jejunum to posterior of stomach through an opening in the much-adherent transverse meso-colon	Died in 23 hours	Shock and peritonitis	—
Linea alba. An incision parallel to the vessels was made through the transverse meso-colon, the margins of this opening were sutured to the stomach, and through it the jejunum was sutured to the stomach posterior wall	Died in 36 hours	Collapse and peritonitis; great anæmia	—

No.	Surgeon.	Reference.	Sex.	Age.	Disease.	Duration and symptoms.	Date of operation.
22	Hahn	Berliner kl. Wochenschrift, 1885, No. 51	M.	45	Cancer of pylorus	Two years. Great wasting	Aug. 7, 1885
23	Hahn	Ibid.	M.	46	Cancer of pylorus adherent to parts around	Indigestion, vomiting, wasting. Lost 18 lbs. in one period of 3 weeks	Aug. 23, 1885
24	Lücke	Same as Case 16	F.	22	Freely movable tumour of pylorus. The word "cancer" not used	For 10 months indigestion, vomiting, constipation, wasting; washing out relieved	Nov. 25, 1885
25	Barker	Brit. Med. Journ., vol. i, 1886, p. 293, and vol. i, 1887, p. 776	F.	37	Cancer of pylorus, with a few enlarged glands	For 18 months sickness, vomiting, and pain. A lump noticed for 5 months	Jan. 5, 1886
26	Lücke	Same as Case 16	F.	45	Cancer of pylorus	For 7 months, at least, vomiting, pain in epigastrium, and wasting; stomach dilated	Jan. 24, 1886
27	Lücke	Ibid.	M.	48	Cancer of pylorus, involving posterior wall of stomach and many glands	For 4 weeks constipation and vomiting, with faecal smell; stomach large, but no tumour felt. After several weeks' washing out a tumour felt; rapid wasting	Mar. 30, 1886
28	Lücke	Ibid.	M.	25	Cicatricial stricture of pylorus	Vomiting, pain, and wasting for 12 months. No tumour felt until shortly before operation	April 3, 1886

Operation.	Result.	Remarks as to effect of operation or necropsy.	Later history.
Wölfler's, without anæsthetic	Died in 24 hours	From perforative peritonitis. Perforation not at site of suture, but from hole (?) made by forceps. Beginning of jejunum sutured	—
Wölfler's	Recovered	Gained rapidly in weight	—
Median incision; Wölfler's; seventy silk Lembert sutures	Recovered	Much shock at first, but rapid improvement after third day. Discharged in 3 weeks, having gained 19 lbs.	Four months later had gained 20 lbs. and looked well; well also at end of 7 months
Median incision. His own modification of Wölfler	Recovered	Slight vomiting for 2 days, relieved by change of posture; steady improvement after. Sat up on 17th day	The first English case. Much comfort for 8 months, when she began to fail. Tumour ultimately adhered to abdominal wall and burst
		externally. Lived 53 weeks. No necropsy. Clearly much benefit, and probably prolongation of life.	
Median incision. Wölfler's. As in Case 24	Recovered	Much collapse. Vomiting distinctly faecal at first. Washing out stomach and aperients relieved. Then improved, and left hospital on March 4, having gained 5 lbs.	Died on June 20, having had return of symptoms for some weeks. Necropsy. Great extension of disease involving the orifice. The passage along the bowel was very difficult from the
		presence of a spur. Thus the duodenal part was much dilated and the rest collapsed. Pylorus quite closed.	
Median incision. Wölfler's	Recovered	Rapid improvement; 6th day, meat; 7th stool; 12th, up. Discharged April 15	Returned on June 19 very ill and died June 21. Necropsy. Great extension of disease and around the opening, but passage quite free both ways. Jejunum had been opened 15 centimetres only from the duodenum
Middle line above and below umbilicus. Wölfler's. The abdomen was sponged out with weak perchloride solution. Drainage-tube used	Recovered	Shock and pain at first, and some soreness of gums. From 8th to 12th day bilious vomiting relieved by washing out. Discharged May 23	In May, 1887, a good account of him; no tumour to be felt. Had gained 13 kilogrammes in weight

No.	Surgeon.	Reference.	Sex.	Age.	Disease.	Duration and symptoms.	Date of operation.
29	Lücke	Same as Case 16	F.	47	Cancer of pylorus, involving also posterior wall of stomach, peritoneum, and glands	For 1 year, indigestion, vomiting, and loss of flesh	June 2, 1886
30	Lücke	Ibid.	F.	39	Tumour of uncertain character in region of gall-bladder	For 2½ years, pain in hepatic region, and jaundice. For 2 months, severe pain, copious vomiting, and wasting	June 12, 1886
31	Jessett	B. M. J., vol. 1, 1888, p. 78, and Lancet, vol. i, 1888, p. 663	M.	50	Pyloric stricture from cicatrix of old ulcer	Melancholia. Much pain, vomiting, and wasting	Feb. 6, 1887
32	Lücke	Same as 16. A mere footnote	F.	36	Carcinoma of pylorus	—	March, 1887
33	Postempski	Morgagni, xxx, 1888, pp. 333—336	F.	31	Cancer of pylorus	For 1 year, indigestion, vomiting, wasting. Tumour to be felt	? Aug., 1887
34	Page	—	M.	48	Cancer of pylorus, stomach, and glands	Vomiting, sarcinæ, and wasting	Dec. 21, 1887
35	Lauenstein	C. für Chir., 1888, No. 26, p. 472	F.	65	Cancer of pylorus, with much gland involvement	Indigestion for long; vomiting and wasting for 3 months	Mar. 13, 1888
36	Fritzche	Brit. Med. Journ., vol. ii, 1888, p. 787; Korrespondenzbl. für Schweizer Aerz., 1888, No. 15; C. für Chir., 1889, No. 2, p. 37	M.	57	Malignant stricture of pylorus	No details	1888

Operation.	Result.	Remarks as to effect of operation or necropsy	Later history.
Median incision. Cancerous piece of peritoneum removed. Direction of gut determined by Nothnagel's experiment	Recovered	No collapse. Trouble from flatulence and diarrhoea, but well enough to leave the hospital in 3 weeks	Died 6 months after at her home.
Median incision. Wölfler's; Nothnagel. A fist-sized tumour extended from the right lobe of the liver backwards towards the spine, having adherent to it the pylorus, the duodenum, and the transverse colon	Recovered	Much collapse and vomiting for 2 days; then rapid improvement, and up on 14th day. Discharged July 11, having gained 10 lbs.	A month later had gained 5 lbs. more; in 11 months still well, and hardly any discomfort.
Wölfler's	Died in 10 days	Did well for 5 days, when violent vomiting came on. Necropsy: union sound No peritonitis	Cause of death due to kinking of the gut, whereby also the bile secreted passed from the duodenum into the stomach by the artificial opening.
Wölfler's	Recovered	Left the hospital in 4 weeks in good general condition	"Es ist dies der Fall, über dessen interessantes chemisches Verhalten Cahn auf dem 6 Congress für innere Medicin berichtete."
Wölfler's. Median incision	Recovered	Did well. No details	—
Median incision. Wölfler's. Barker	Recovered	General comfort and improvement. Almost entire cessation of vomiting, but no gain in weight	Died in 10 weeks and 8 days. Portion of gut sutured 9 inches only from ileo-cæcal valve. Fistula very small.
Median incision. Chose a piece of gut directly under the transverse colon, and tested peristalsis by Nothnagel	Died in 11 days	Copious diarrhoea set in on 3rd day, and unchanged food was passed <i>per rectum</i> . Exhaustion. Operation wound had done well	Point sutured was 40 centimetres above the ileo-cæcal valve. The greater part of the small intestine was lying in a cluster and quite empty. Fistula good and sound
—	Recovered	Rapidly well. Secondary suture of abdominal wall necessary, stitches having given way on 10th day	Gained 10 kilogrammes in 3 months, and 7 months after operation was in good health. Sensation of constant hunger and of food passing quickly out of stomach

No.	Surgeon.	Reference.	Sex.	Age.	Disease.	Duration and symptoms.	Date of operation.
37	Fritzche	Ibid.	F.	37	Simple cicatricial constriction of pylorus	No details	1888
38	Rydygier and Jaworski	Dtsche. med. Wochsch., No. 14, 1889	M.	60	Malignant pyloric growth adherent to liver and stretching on stomach; glands enlarged	One year indigestion, pain, vomiting, loss of flesh; tumour felt	Dec. 21, 1888
39	Ransohoff	Polyclinic, Feb., 1889, and Med. Chronicle, June, 1889, p. 226	M.	37	Cancer of pylorus; nodule in liver	Vomiting persistent and excessive; tumour to be felt	? Dec., 1888
<i>In addition to these there are two cases in which Pylorectomy was</i>							
40	Billroth	von Hacker's Monograph	M.	48	Malignant stricture of pylorus	For nine months discomfort after food; vomiting for two months; tumour felt for five weeks	Jan. 15, 1885
41	Krönlein	C. für Chir., 1888, No. 40, p. 744	M.	24	Traumatic stricture of pylorus, due (?) to severe blow on pit of stomach in March, 1887	Great local pain and constant vomiting, from time of his fall from horse	Nov. 24, 1887

NOTE.—At the Eighteenth Congress of German Surgeons this year ('Beilage zum and Lauenstein, of Hamburg, to six and nine cases respectively; but there

Operation.	Result.	Remarks as to effect of operation or necropsy.	Later history.
—	Recovered	In 2 months had gained 10 kilogrammes, and at end of 77 days was perfectly well and able to eat anything	—
Median incision. Wölfler's and Barker	Recovered	Strength and weight slowly but steadily gained, and symptoms relieved. Increased by Feb. 10 from 47·2 kilogrammes to 50·1 kilogrammes	Paper records extensive observations on the capacity of the stomach and the improvement in digestive processes
Median incision. Senn's bone plates used	Recovered	"Temp. rose to 101·5° Fahr., but the patient progressed to convalescence without mishap"	—
<i>performed at the same time as the Gastro-enterostomy, viz. :</i>			
The pulse being very good after suture of stomach and jejunum together, the pyloric growth was removed, the divided ends of stomach and duodenum being then separately closed by suture	Recovered	Rapid convalescence. Discharged in 4 weeks, having gained $\frac{1}{2}$ kilogr.	Symptoms soon afterwards returned. The disease then made rapid advance, and he died in May. Prolongation of life very doubtful
Resection of pylorus, which was closely adherent to liver. The lumen of this resultant opening being found too small, Krönlein proceeded at once to gastro-enterostomy, it being impossible to resect, because of adhesion, a large enough piece of duodenum	Died next day	Never rallied from collapse	—

Centralblatt für Chirurgie, 1889, No. 29) reference was made by Augerer, of Munich, are no sufficient details to allow of their being included in the above table.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' Third Series, vol. i, p. 126.)

DESCRIPTION OF PLATES IX AND X.

A Case of Gastro-enterostomy ; with a Table of the Cases hitherto recorded (HERBERT W. PAGE, M.C.).

These figures represent in order of number the various steps of the operation, from isolation of the portion of bowel in fig. 2 (Plate IX), approximation and suture of the stomach and intestine in figs. 5 and 6 (Plate IX), figs. 1—5 (Plate X), to the final union by suture in fig. 6 (Plate X).

St. = Stomach.

Int. = Intestine.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

A. B. Esqley del.

Danielsson & Co. Sculp.