removal of carcinoma of the stomach, all that had been done by him at the time. Out of the first 4, as I have told you, he lost 3, while out of the last 20 only 2 had died; in other words, he has only lost 2 cases of pylorotomy since the year 1888 out of 20 cases. Considering that in the history of all great operations the first cases are always defective both as regards diagnosis and technique, his figures give, I venture to think, a good omen for the future. And when we look to the ultimate results of this group of cases alone we have also reason for encouragement. Two cases died between the first and second month of pneumonia and paralysis of the heart; 8 died of recurrence, 2 in the third year after operation, 4 in the second year after operation, 2 in the first year after operation, an average duration of life of 507 days; 8 cases were alive at the time of writing, without obvious recurrence, 2 in the fourth year after operation, 6 in the first year after operation, and 1 had obvious recurrence. If these results are compared with those of cases left to themselves or treated by gastro-enterostomy the contrast is striking. The 7 cases who refused operation show an average duration of life of 209 days; the 19 who were declared beyond the reach of operation 77 days, and 19 cases on whom only an exploratory operation was done an average of 139 days, an average duration of 110 days for the cases traced up to the time of death=36. This shows pretty well the gain to those who were operated on, and yet died ultimately of recurrence, without counting those who are still alive with no apparent disease.

But, besides these cases of Krönlein there are, of course, many others to which I could refer you, in which the duration of life after operation was even longer, and in which a microscopical examination of the parts removed left no doubt as to the carcinomatous nature of the growth. Kocher, for instance, records a case alive and well nine years after pylorotomy for carcinoma.

Next to the early recognition of the condition of the stomach, for which an operation may be required, and an early decision as to whether or not the latter is admissible (which is a matter only to be determined after considerable experience), the next most important factor in success is the whole technique of the operation. This is a very large point, and admits of considerable difference of opinion in regard to detail. But there are several points of general principle upon which all surgeons of experience are agreed, and these you will do well to bear constantly in mind, whether you are acting as principals or assistants in such operations.

In the first place, in all cases in which the stomach is to be operated on a careful preparation of the patient is necessary. This not only includes the thorough cleansing of the abdomen externally but also of the stomach internally. The latter must be washed out several times for a couple of days before operation—except, of course, in cases of perforated gastric ulcer. Each washing ought not, however, to be carried to the extent of exhausting the patient. In the case of pylorotomy before you it was done only a couple of times, the last being only just before operation.

The next point of principle is the saving of time in the operation on patients already depressed by the disease and its consequences. This may be promoted in various ways. Those who assist can help by a little foresight, as well as those who actually operate. From the moment the first incision is made to the last stitch, we ought to aim at saving every possible second of time. And remember that this is of importance not only in reducing the immediate effects of shock, but also in exposing the wounded parts and abdomen for as short a time as possible to the injurious effect of germ-laden air. Again, shock may be minimised by gentle, if rapid, handling of the viscera. This is most important where we are handling the stomach so close to the great nerve plexus of the abdomen. Again, in manipulating the viscera, we must be careful, while securing asepsis, to avoid all overstimulating of serous surfaces with chemical antiseptics. Probably nothing has more contributed to the success of operations on the alimentary tract within recent years than the use of sterilisation of the materials, instruments, etc., introduced into the abdomen, rather than chemical antiseptics, which are now well recognised as capable of adding greatly to the shock of operations.

The next most important matters are the stitching, clamping, and closing of the divided viscera without loss of

time or blood, and without escape of their contents. To consider all these in detail would lead me too far now, and I can only say that the keynote of them all is thoroughness without loss of time. They must all be thought out beforehand, and seen whenever possible, and there should be no hesitation at any moment as to what is to be done.

Finally, the after-treatment of these patients is of the utmost importance. They must be kept warm from beginning to end, and if there is any prostration saline solution must be transfused either subcutaneously or into a vein, or both. It may also be necessary to inject brandy or ether subcutaneously. Rectal feeding is the rule with all my abdominal sections, and also enemata of hot water every four hours. But besides all this, patients may be fed by the mouth from the first moment after operation unless vomiting is severe. In the present cases the first food has consisted of white of egg beaten up with a little brandy and an equal part of water. Of this fluid they have had 3ij every two hours at first, and then every hour; a day or two later double the amount, and then milk. At the end of ten days they have been the better for pounded fish and meat, and then a little vegetable cautiously. The patient before you is now—on the seventeenth day—having as much food as she expresses a desire for, and is able to sit up in bed. She is putting on flesh quite visibly, and I hope she may be up and about by the end of next week.

It is, I think, plain in this case that the technique and after-treatment have been adequate. But, at the same time, I can see many points in the operation as it was done in which I should make improvements in the future, both as regards protection against contamination by the contents of the viscera and in saving of time. I have very little doubt that in another uncomplicated case I could do the two operations of retrocolic gastroenterostomy and pylorotomy in one sitting in the same time that was required for the pylorotomy alone. That this case was placed in my hands so early and in an uncomplicated stage I owe to the ability of my old house-surgeon, Mr. J. H. Cook, who lost no time, and so probably saved the patient's life.

NOTES AND REFERENCE.

¹ No. 1 has died since this lecture was delivered; his doctor tells me that he died of asthenia, and without pain or other distress during the 7½ months lived since the operation. ² This patient is now out of bed in the fourth week after operation, and is eating practically what she likes without pain or discomfort and with regular action of the bowels. ³ *Lectures on Surgery of the Stomach*, 1898.

ON OPERATIONS FOR GASTRIC HÆMORRHAGE AND PERFORATION:

WITH AN ACCOUNT OF A SUCCESSFUL OPERATION FOR PERFORATING GASTRIC ULCER.

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BEFORE deciding to operate for severe and recurrent hæmatemesis, the question must always arise, Will the chances of the patient's recovery be improved by the operation or not? It is quite likely that the surgeon will not be called in until all the usual medical measures have been tried and have failed, and then the probability of the success of the operation is lessened by the feeble condition of the patient. It is remarkable, too, how many cases recover under medical care from very severe hæmorrhage, and the possibility of such taking place in any individual case must always influence the question of surgical interference; but when, as in the first case quoted hereafter, all the usual remedies have been applied and the hæmorrhage continues, then the surgeon must act.

CASE I. *Very severe Hæmorrhage from a Gastric Ulcer: Operation: Entire Arrest of the Hæmorrhage: Death from Exhaustion Ten Days after Operation.*—J. F., aged 27, was admitted into Westminster Hospital on September 13th, 1898, under the care of my colleague, Dr. Donkin, for severe gastric hæmorrhage. He had had good health until the end of August, when he began to suffer from nausea and "heaving," but without vomiting. On September 13th he felt faint and sick. He took some whisky and water, and suddenly brought up a large amount of blood, when he was at once taken to the hospital. The usual medical remedies were applied, but on September 16th he again vomited much blood. Of this 30 ozs. were caught and measured. On September 20th he vomited 40 ozs., and on September 21st 20 ozs., so that he must have lost at least one-third of the total weight of the blood in his body, and probably much more, as no estimate of the first hæmorrhage only a part of the second was obtained.

He was transfused on September 20th with normal saline solution, and again on the next day. On this day, the 21st, Dr. Donkin asked me to attempt some surgical measure for arrest of the hæmorrhage. When I saw the patient he was practically moribund, but after transfusion of 2 pints of normal saline solution into the arm and injection of 1 pint of normal saline solution with 2 ozs. of brandy into the rectum, and the subcutaneous injection of 3 minims of liquor strychninæ, he slightly rallied. But so grave was his condition that it did not seem advisable to have him removed from the bed and the operation was done there. The abdomen was opened and on touching the stomach he again vomited blood and stopped breathing, but with artificial respiration and another injection of liquor strychninæ he rallied slightly and the operation was proceeded with. No suspicious spot was found on the anterior wall of the stomach, so the abdominal wound was enlarged, the stomach and great omentum turned upwards and the under-layer of the transverse mesocolon torn through so as to reach the posterior aspect of the stomach. On this there was noticed a spot which was thin in the centre and indurated peripherally, while radiating from it were four or five thrombosed vessels. At this stage the patient again became collapsed, but was brought round. There was therefore no time for elaborate measures such as attempting to ligature the arteries separately by under-running them with a curved needle. A portion of the stomach wall corresponding to the whole extent of the ulcer was pinched up into a fold and a continuous purse-string suture was passed through the base of this fold approximating mucous membrane to mucous membrane, so shutting off what was believed to be the bleeding spot from the rest of the stomach cavity. The suture was applied near the pylorus and 1 inch from the lesser curvature. The abdomen was filled with normal saline solution and closed. He rallied from the operation. He vomited on the 23rd, but there was no blood in the vomit. It was therefore presumed that the ulcer had been secured. But his general condition gave rise to serious anxiety. At no time did the pulse fall below 150 per minute and the heart sounds were characteristic of extreme loss of blood. His temperature remained subnormal. He continued in the same feeble condition until September 30th when he died, nine days after the operation and seventeen days after the first onset of hæmorrhage. The *post-mortem* examination showed that the ulcer had been secured. When the stitch was liberated a large eroded vessel with a clot in its lumen was found. There was a second ulcer about 2 inches away from the first, but no hæmorrhage had apparently arisen from this, since the stomach cavity was quite free from blood and no altered blood was found in the intestine. So far, then, as the immediate result of the operation for hæmorrhage was concerned it was a success.

CASE II. Symptoms of Perforation of the Stomach: Death from Hæmorrhage.—On August 31st, 1898, I was asked by Dr. W. Southey Wright, of Carshalton, to see Mrs. K., aged 31. There was a previous history of occasional dyspepsia, but the patient had never vomited blood, and it had never seriously inconvenienced her. On August 29th Dr. Wright was called to her on account of intense and sudden pain in the left hypochondriac region. He found her considerably collapsed, and retching somewhat. She was put to bed, hot bottles applied to the feet, a little ice given her to suck, and a rectal enema containing opium was ordered. On the next day he found the abdomen full, tense, and tympanitic. But towards evening, that is, of the 30th, she became very much better in every respect. The pain disappeared, the abdomen lost its fulness, and she expressed herself as being comfortable. When I saw her on the afternoon of August 31st her condition appeared to be favourable, her colour was good, the pulse 78 and of good volume, the temperature normal, the respiration unembarrassed, the abdomen in no way distended, with no undue dullness at any spot. She complained of a little tenderness on pressure in two regions—in the left iliac fossa and the left hypochondrium; but this was not at all marked. Her menstrual period was overdue for two days, and it seemed that her symptoms might equally well be assigned to a hæmatocèle, as there was decided fulness above and to the left of the os uteri. It was decided, however, to continue rectal feeding, and to take all the precautions usual in cases of acute gastric ulcer. On Friday, September 2nd, I received an urgent message as the patient was collapsed again: the abdomen had become distended and tympanitic, and her condition was alarming. When I arrived she was in an extreme state of collapse, and although the liver dullness was not lost, I suspected that a small perforation had occurred. It seemed advisable to operate forthwith, although it appeared unlikely that a successful result would follow. The abdomen was opened in the middle line above the umbilicus, and search was begun for the perforation. At the moment of touching the stomach she retched and brought up a very large quantity of black clotted blood. Her breathing ceased, and all efforts to restore her were unavailing. No *post-mortem* examination was permitted, and so it was only possible to surmise what had occurred.

It seemed probable that there was an ulcer in the stomach, the floor of which was at one spot of extreme thinness; that on the first occasion of the collapse, on August 29th, a minute perforation had occurred which became temporarily sealed after the careful treatment adopted, or perhaps that the ulcer had perforated into the lesser sac. Somewhere about the margins of the ulcer there may have been a large vessel which gave way on September 2nd, or a second ulcer may have been the cause of the hæmorrhage.

Three facts stand out prominently: The onset of the illness was with symptoms such as are usually associated with perforation; an apparent recovery took place after the first onset of symptoms; and the immediate cause of death was gastric hæmorrhage.

Looking back on the case, one feels that if an operation had been performed on August 31st, when Dr. Wright and I first saw her together, her life might have been saved. But it is open to doubt if many surgeons would insist upon operating with a pulse of 78, normal temperature and respiration, no fulness of the abdomen, and no general distress.

The case is a notable example of what may be termed the "latent period" of this condition. After the acute onset the symptoms subside, and there seems to be no imminent danger. This period lasts twenty-four to forty-eight hours, and is then followed by the acutest possible symptoms, and then an operation is often too late. There can, however, be no doubt that in the hands of an experienced surgeon, an exploratory laparotomy is almost without risk, and if it be suspected that we are face to face with a "latent period," exploration must be undertaken.

The complications of gastric ulcer, so far as the surgeon is concerned, are progressive dilatation of the stomach, general weakness of the patient, severe or repeated hæmatemesis and perforation. Unfortunately, an ulcer which is severe enough to perforate is also sufficiently severe to open up large vessels in the floor, so that it must always happen that a certain number of cases apparently successfully operated upon for perforation will during the first month die of hæmatemesis, either from hæmorrhage from the site of the perforating ulcer or from a second ulcer. Hæmatemesis may be severe and repeated, yet not necessarily such as to enforce the surgical rule to find the bleeding spot and stop the flow of blood at that spot. For cases of this less urgent description there are several courses open. Direct resection of the stomach wall and the ulcer is not always advisable or possible. If, however, a small ulcer, which is easily found with one finger inside the stomach, be present, and if it be readily accessible, resection and suture may be carried out. But more often it is better to enclose the ulcer by putting in a continuous puckering suture of silk, or to quilt with fine silk the whole surface of the ulcer with a number of parallel sutures placed closely side by side. In cases of ulcers at the pylorus, gastroenterostomy is undoubtedly the best measure, and Doyen¹ "considers that it cures by abolishing the reflex spasm of the pylorus, which is the chief factor in causing dilation, hæmatemesis, and perforation. It permits the ulcer to heal spontaneously; it does more perfectly what is accomplished by abstention from food by the mouth."

But there is another class of cases of hæmatemesis of which Case I is an example where it is not possible to carry out any prolonged procedures, and the question arises, Is it justifiable to interfere surgically in any way? I am strongly of opinion that the local success in this case should encourage us to repeat the operation on another occasion. As to the preparation of the patient in such cases, he should undoubtedly be transfused before the operation and the apparatus should be kept ready in case of collapse during it. It is also valuable to fill the peritoneal cavity with normal saline solution at the close of the operation on account of the well-known absorbing power of that serous cavity. Ether and strychnine should also be ready for subcutaneous injection. The ulcer may sometimes be found by palpation from without the stomach. Indeed, in many cases of urgency it is the only admissible method. If time and the condition of the patient allow, the stomach wall should be opened and the finger inserted to verify the localisation of the ulcer. But it is evident that it cannot always be possible. The method of dealing with the vessels is rather difficult to decide upon. If time had permitted I should have ligatured the vessels separately. With this there is always the theoretical risk of necrosis of the stomach wall—theoretical because there is no reliable statement on the subject. Failing separate ligature of the vessels, it would be advisable to quilt the stomach wall and the ulcer by several parallel continuous sutures and if time presses exceedingly, the simplest suture is the one which was adopted in Case I.

CASE III. Acute Perforation of Gastric Ulcer: General Peritonitis: Operation on the Third Day: Recovery from Perforation: Death on the Twenty-third Day after Operation from Hæmorrhage.—A. N., aged 17, was admitted into the Westminster Hospital, under the care of Dr. Hebb, on January 1st, 1899. For the past two months she had had pain in the back and left shoulder. On the evening of December 31st the pain suddenly became worse while she was at her work. On admission to the hospital her abdomen was tense and very tender, but she was not markedly collapsed; in fact, the general condition was fairly good. On January 3rd, when seen by me, the liver dullness had entirely disappeared, the abdomen was full and tympanitic, and I decided to operate at once. The usual incision was made above the umbilicus, and it was noticed that there was early peritonitis, and gas in the peritoneal cavity, but no food could be found in it. It was necessary to enlarge the incision transversely towards the left side, and on gently pulling down the stomach some adhesions between it and the liver were separated. The perforation was then discovered. This was clean cut, oval in shape, three-quarters by half an inch in dimen-

sion, and situated on the anterior wall near the lesser curvature, and about 1 to 1½ inch from the cardiac orifice. The stomach wall was inverted, and an attempt made to stitch it by Lembert sutures. These held very badly, as the stomach wall for some distance around the ulcer was softened. The great omentum was then turned up, and a large patch stitched with interrupted sutures over the floor of the ulcer. The portion of omentum included in the stitches measured about 2 inches in diameter. The stomach wall with the attached omentum was then folded and stitched. The abdomen was irrigated with warm saline solution, and a large drainage tube was left in at the outer extremity of the transverse portion of the incision. About sixty Lembert sutures were put into the stomach and omentum, and the operation lasted nearly two hours. I received valuable assistance from my colleague, Mr. Spencer. For two or three days her condition fluctuated considerably, but it was always low. On January 7th, four days after the operation, it was noted that the abdomen had become flaccid. At this time severe diarrhoea set in, so that she could not retain the enemata, and it was necessary to feed her by the mouth with very small quantities of meat-juice and beef-tea. On the 13th she was not so well, but the diarrhoea had become somewhat less. On the 21st inst. she had a sharp attack of hæmatemesis, and also passed blood by the bowel. This attack seemed to be due and certainly followed the taking of a little hard-boiled yolk of egg which I allowed her. On January 26th she had another severe attack of bleeding, and died at 10.45 P.M. At the *post-mortem* examination it was found that the perforation was firmly closed, but the bleeding had come from the outer margin of the gastric ulcer, which was at such a distance from the site of perforation that it had not been included in the stitches.

CASE IV. Gastric Ulcer: Perforation: Operation Twenty-eight Hours afterwards: Recovery.—Miss C., aged 21, was seen by me on October 28th, 1898, in consultation with Dr. B. N. Dalton, of South Norwood. She had previously had some dyspeptic symptoms, but had never vomited blood. On October 27th, somewhat late in the afternoon, she had a sensation of cramp in the stomach, and took some hot tea for its relief. The pain immediately became worse, and she attempted to vomit. Dr. Dalton, who saw her very shortly afterwards, suspected that a gastric ulcer might have given way. She was seen by him the next morning, the 28th, and he, finding that the liver dulness had gone, diagnosed perforation. She was seen by Dr. Newton Pitt in consultation with Dr. Dalton on the afternoon of the 28th, and he fully concurred in the propriety of immediate operation, which was carried out the same evening. Just before the operation her pulse was 108, her temperature 99.2°, her respirations 28, and mostly costal, but the abdomen still moved. Her face was slightly drawn, but of fair colour, and she was not markedly collapsed. There was no great degree of abdominal distension. She complained of severe pain on touching the upper segment of the left rectus, which was firm and rigid. On the whole her condition was decidedly good. The operation was begun at 11 P.M. by the usual median incision. On opening the peritoneum gas escaped. On the anterior wall of the stomach some lymph was found just below the cardiac orifice of the stomach. From a spot in the centre of this patch, after pressing on the stomach, gas and fluid escaped. There was at this point a minute ill-defined perforation, situated 1½ inch below the cardiac orifice of the stomach, and 1 inch below the lesser curvature in the anterior wall. On more carefully examining the stomach in this position a large indurated ulcer could be felt about the size of half-a-crown, or perhaps larger, and there could be clearly seen in addition to the perforation three other doubtful spots which looked as if on the point of giving way. There was no food free in the peritoneal cavity, and there was no peritonitis. At first an attempt was made to infold a portion of the stomach wall, but it was soon seen that if sufficient of the wall were taken up so as to include the ulcer and give healthy tissue firm enough to hold the stitches little or no lumen would be left to the stomach at that spot. The fold plan was, therefore, abandoned, and the great omentum was turned up and a thick vascular portion of its free margin selected. This was laid over the whole ulcer so as to cover it and the stomach wall for half an inch beyond. A row of interrupted sutures was then put in about half an inch from the free margin of the omentum and across the base of the flap, taking care not to include all the blood vessels. A second set of sutures united the free margin of the omentum and the stomach wall, and another row was placed across the base of the first with the same precautions as to the vessels. The time occupied in suturing was considerably over one hour, and the total duration of the operation was two hours and a quarter. The breathing became very faint at times, so that the anæsthetic had to be stopped and brandy given hypodermically. Before the abdomen was closed the cavity was washed out with warm normal saline solution, and a considerable quantity was left in. A glass drainage tube was put into the abdominal wound and the remainder of it sewn up. The patient's recovery was slow but regular, with the exception of vomiting three or four times on the second day after the operation. No opium nor morphine was given, but some bismuth salicylate was administered by the mouth, with occasional teaspoonfuls of hot water to allay thirst. At the end of January of this year she went away to Hastings, and on March 5th she noticed some irritation about the wound, and a piece of silk made its appearance. This, no doubt, was the continuous suture with which the peritoneum was sewn up.

From the surgical point of view perforating gastric ulcer may be either acute, occurring into the general peritoneal cavity, or chronic, in which adhesions have time to form, giving rise to a localised abscess bounded by the neighbouring viscera and adherent peritoneum. The mode of procedure of course differs in these two classes of cases. The diagnosis of acute perforation is not, as a rule, difficult, unless the early symptoms be comparatively slight and the latent period well marked, as in Case II. The previous history of the case, and the lightning-like onset of exceedingly severe symptoms, are sufficient to arouse something more than suspicion. The diagnosis is confirmed by the localisation of pain to the upper segment of the abdomen, the rapid onset of peritonitis, and

the disappearance of liver dulness. If one waits for further symptoms the opportunity of saving life is gone. The all-important question here is one of time, and statistics show that of cases treated surgically within the first twenty-four hours over 40 per cent. recover, but that cases left till the third day are all but hopeless. There are many difficulties which confront the surgeon in dealing with these cases: among them are the finding of the perforation, its accessibility, suturing in a cramped and obscure corner of the abdomen, the softened state of the stomach walls for some distance round the ulcer, and the cleansing of the peritoneal cavity from food. These may be overcome by gentle and systematic searching of the whole surface of the stomach with the help of two trained assistants, a good light, together with persistent care in putting in all the sutures, and thorough irrigation of the peritoneal cavity with normal saline solution and efficient after-drainage. It is not always enough to merely drain from the front, but large drainage tubes should be passed through the loins avoiding the kidneys, if much of the gastric contents have escaped. There should be no haste to remove these. It seems to be always a good plan to reinforce the wall of the stomach at the ulcerated spot by grafting omentum on to it; it makes assurance doubly sure.

REFERENCE.

¹ Greig Smith, *Abdominal Surgery*, Fifth Edition, vol. i, p. 568.

ON THE SURGICAL TREATMENT OF UTERINE CANCER AND ITS RECURRENCES.

By DR. THEODOR LANDAU,
Berlin.

A SERUM for carcinoma which actually benefits the patient has not yet been found. Up to the present time there can be no doubt that of all methods the surgical still yields the best results, and the earlier the stage of the carcinoma when attacked the better. Therefore, it is the desire of our time to make the diagnosis as early as possible, and not only to extirpate the macroscopically diseased parts but also to remove as much as possible of the neighbouring lymph vessels and glands. That is well proved by the now recognised procedure of removing mammary carcinoma. At first only the diseased portions of the mamma were removed; then we removed the entire gland; next was added the extirpation of the neighbouring axillary glands. To-day we remove in addition the pectoral fascia, and even sometimes the entire thickness of the sternal portion of the pectoralis major. And why these more and more radical methods? Because the permanent results have become better in proportion as the operations increased in extent. Likewise similar tendencies are observed in regard to operations for carcinoma of the uterus.

Whoever has had the opportunity of observing the development and course of carcinomata of the various organs easily recognises that every organ has, so to speak, its cancer characteristic, both as regards its histological structure and also in regard to its tendency to metastasis. Thus we may say that carcinoma of the uterus has a marked tendency to remain local; so that the patients are destroyed much more frequently by the uterine cancer itself or by direct spread to neighbouring organs than by metastasis. This especially holds good for carcinoma of the body of the uterus. The course of the disease is usually the following: at first cancer is confined to the womb, then the pelvic connective tissue and its lymph vessels become involved; then it spreads to the vagina, rectum, bladder, ureters, and peritoneum, and affects the lymphatic glands and distant organs only very late, and after large portions of the parametrium have been destroyed. This is readily proved by the *post-mortem* findings in death occurring from uterine cancer or after its extirpation; it is daily shown by clinical observation that most cases of inoperable carcinoma are such, not because of metastasis in distant organs, but because we fear that bladder, ureters, and intestine may be injured by the operation.

The study of the recurrence gives a further support to the above claim. Whether we assume that the recurrence is only the growth of foci that have been left behind, or that it is