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PYLORECTOMY FOR CARCINOMA.

By CARL BECK, M.D.

The early and extensive removal of carcinoma of the breast has rewarded the surgeon with successes of which, but a few years ago, he did not dream of. On the other hand, extirpation of the carcinoma pylori is still considered an extremely unpromising procedure; and the reasons for this unfortunate state of affairs are obvious. A carcinomatous nodule in the breast, no matter how small it may be, can be seen as well as palpated, while a small nodule on the pylorus does not cause any perceptible symptoms at all, and will, therefore not be diagnosticated. It is only after the pain following each meal, the frequent vomiting, the cachexia, and the presence of a tumor in the pyloric region have originated the suspicion of a malignant growth, that operative steps will be considered. But when the peritoneal coat of the stomach, the adjacent serous surfaces, and the glands in the gastro-hepatic omentum have become involved, pylorectomy will, of course, be as unpromising an undertaking as *amputatio mammæ* when the carcinoma extends down to the intercostal space.

As alluded to the presence of a small cancerous nodule in the pylorus cannot be diagnosticated. But in the greater number of cases there is a period when the carcinoma, while it extends over a considerable portion of the pylorus or over its entirety, is still confined to the pylorus alone. In these cases a diagnosis can always be made; and pylorectomy, if done under proper precautions, yields a favorable prognosis.

In these cases the salient point of success, as in many other surgical diseases, is in the early diagnosis. First of all, it is to be considered that the carcinoma of the pylorus occurs only in patients of from forty to sixty years, the average age being about fifty-four. (Among a very large number of cases I have seen carcinoma pylori but once below forty. It concerned a lady of 35 years, which I regard most unusual. Pylorectomy being performed by me, I could easily verify the diagnosis by the microscope.) The symptoms of the disease are vague at first, only slight disturbances of digestion, decrease of appetite, etc. being noted. Such symptoms are generally attributed to the assumed presence of a chronic gastritis; but if they occur in an individual of the age alluded to, and particularly if he has had an excellent digestion all through his life time, and could stand all kinds of food without noticing any disturbance, carcinoma should be suspected.

As soon as the carcinomatous infiltration begins to narrow the lumen of the pylorus, the symptoms become typical. Pain, nausea, and vomiting set in, stagnation of the meals producing permanent indigestion. Anacidity as well as the presence of the lactic acid in the juice of the stomach will also be noted. In far the greater majority of cases

free muriatic acid is absent. In advanced cases hæmatemesis will indicate that ulceration of the cancerous portion, arrosion of blood-vessels, etc., has taken place. At this stage the symptoms of cachexia are of course also well pronounced.

But more important than all the symptoms described is the existence of a palpable tumor in the pyloric region. In advanced stages it can even be noted by simple ocular inspection. But at an early period careful palpation will often reveal a small, hard, well defined tumor of an uneven surface. In the beginning the tumor is generally movable. The act of respiration does not influence its situation. Percussion is dull-tympanitic.

If any doubt be still left, the tumor can often be outlined, if the abdominal walls are thoroughly relaxed under anæsthesia. To make the outlines of the stomach visible, I introduce into the stomach a soft rubber tube, its eye not cut out and its lumen filled with thin, flexible steel wire in spiral form. Exposure to the Rœntgen rays shows the spiral and indicates the outlines of the stomach. As a landmark, the ribs may serve as well as the umbilicus, which can be made visible by fastening a penny to it with adhesive plaster. Conclusions can thus be drawn upon the size, the position and the relations of the stomach. (Compare my article on the "Rœntgen Rays in Surgery," in *International Medical Magazine*, May, 1897).

Pylorectomy should only be performed after the most thorough preparations. The limit of space forbids a detailed description of the technique of the operation, but I will emphasize a few most important and too often neglected points, the close observation of which, in my opinion, warrant success.

The patient should be well fed per os as well as per rectum, but the day before the operation the stomach must be washed out about three hours after each meal. The bowels must also be thoroughly evacuated. During the last twenty-four hours strophantus and hypodermatical saline infusions should be administered, to stimulate the patient as much as possible.

It is needless to say that the most minute aseptic precautions have to be taken. A poultice of green soap should cover the area of operation for twenty-four hours before operation, and finally scrubbing with alcohol and bichloride must be done. No antiseptics are used during the operation. There is no doubt that no small number of cases of collapse have occurred on account of the use of antiseptic drugs during the operation. After the pylorus is carefully isolated and a stomachal opening made, the whole stomach is packed with a very large strip of aseptic gauze in order to prevent the escape of any contaminating fluid from the stomach. The same procedure is carried out on the duodenal portion. Such temporary packing is apt to prevent infection, and is of as great value here as is its methodical application in operations upon other hollow organs, such as intestine, gall and urinary bladder, or in the treatment of a hydronephrotic sac.

Besides the tampons, clamps for the temporary occlusion of the duodenal as well as of the stomachal opening may be used. The most

reliable assistant's hands can never keep the large openings so tightly together that nothing of the stomachal or duodenal contents would escape. The compression caused by the clamps, if it should really injure the mucosa or muscularis, will certainly not at all impair the more resistant serosa.

The most important point of the operation is the question of approximation. I am not in favor of using the Murphy button for that purpose. While I admit that the use of this most ingenious contrivance is *better than a poor suture, I believe that a good suture is better than the best button.* The suture should be as simple as possible. It seems to me. that in the effort to get a perfectly secure occlusion, too complicated means were devised, and in consequence the contrary result to the desired one occurred. Nothing is securer than a simple continuous suture, including the muscularis and the serosa, provided their margins are minutely approximated. Stitching of the mucosa must be carefully avoided. If too many sutures are applied, the blood supply becomes impaired, and agglutination becomes less secure. As it is impossible to render the stomach absolutely aseptic before operation, the mucosa must be regarded as a more or less infected area, and stitching through it with the suturing needle therefore means no less than septic inoculation. After the suture is completed, the mesentery must be carefully united. It is advisable to attach it to the sutured area, so that it envelops it, so to speak.

Another vital point is the choice of the suture material. It seems to me that since I use the thinnest size of formalin-catgut* I am more lucky in intestinal surgery than I used to be before, when I used silk. It is only since Hofmeister showed us the possibility of boiling the catgut without impairing its tensile strength, that we possess an absorbable material, the real aseptic state of which can no longer be disputed.

After the suturing is completed, iodoform powder is dusted over the stitches. The abdominal wound is closed entirely, no gauze packing being done at all.

Twenty-four hours after the operation the stomach must be washed out again. There is always some tendency to decomposition in the stomach, which will tend to infection by absorption as well as by contamination of the wound and stitches. If the irrigation is done carefully, no divulsion of the wound margins will occur. If the patien should be emaciated, he should be nourished by the rectum as well as get food per os. Ice-cold milk, wine and bouillon can be given as early as five hours after the operation. On the fourth day soft-boiled eggs can be allowed. The patient should lie mostly on his right side. Thus

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*Formalin-catgut is prepared as follows: After being wound on a large nickel frame, the new catgut is immersed in a four per cent. aqueous solution of formalin for forty-eighth hours. The formalin changes the texture of the catgut in such a manner that its tensile strength is increased by boiling. To get rid of the formalin again, the catgut is kept in flowing water for another twelve hours, and can be boiled now for about fifteen minutes; then it is kept in a solution consisting of

Mercur. bichlor. corros....................1
Glycerine....................5
Alcohol. absolut....................1000

Great credit is due to N. Senn for having introduced and modified this new process in this country.

the contents of the stomach will easier move forward into the duodenum, the contractility of the pylorus being gone.

If all these points are carefully observed, and if it is particularly borne in mind that the success of pylorectomy largely depends upon the really aseptic suture, the appalling mortality of this blissful operation would soon become very much smaller. Its advantages over gastro-enterostomy are so great that even in more advanced cases I cannot persuade myself to give it up in favor of the latter. It seems to me that if in advanced cases an operation is decided upon, it should consist in the removal of the cancerous tissue, provided such is technically possible. If adhesions towards the transverse mesocolon necessitate dissection from them, which cuts off the blood supply, gangrene of the transverse colon will follow. It is therefore indicated to resect this portion of the transverse colon in such cases also. A patient in such a state has indeed nothing to lose, and it is better to subject him to a great risk by moving the diseased area entirely, than to give him one or two months more by choosing a palliative operation, the immediate chances of which may, perhaps, be slightly less dangerous. Kocher, who enjoys the reputation of being a very radical operator, and who does not hesitate to resect the whole transverse colon, if necessary, reports recently that his mortality rate of pylorectomy has fallen to twenty per cent.

How quickly recovery takes place after pylorectomy, if the diagnosis is made early, may be illustrated by the following case presented to the New York County Medical Society (May 24, 1897):

M. L., fifty-five years of age, a farmer, after having been a healthy man all his life, began to suffer from digestive disturbances in October, 1896. From January, 1897, he also noted slight pain in the epigastrium with nausea and constipation. Lately vomiting had set in also. After having been treated for dyspepsia for several months, the patient was examined by Dr. Wilcox, of Ticonderoga, N. Y., to whom great credit is due for having recognized that the "digestive disturbances" were due to a carcinoma pylori. He recommended its immediate extirpation.

On May 5, 1897, when I saw the patient first, I found the following conditions present: Man of fifty-five years of age, apparently older, thin and slimly built, slightly cachectic. The pale face indicated considerable anæmia. Examination of heart and lungs as well as that of the urine, revealed nothing abnormal. Examination of the contents of the stomach shows decided lactic acid reaction. There was no free H. Cl. When the stomach was filled with water, the semilunar area above the symphysis, which was tympanitic formerly, became dull. Palpation revealed the presence of a small, well-defined movable tumor in the right side, two inches laterally and on one inch below the umbilicus.

May 8, 1897, operation under ether. The tumor was easily isolated, and one lymphatic gland of the size of a bean was removed from the mesentery Division of the healthy walls of duodenum and stomach, one inch from each margin of the diseased portion ; one continuous row of formalin-catgut sutures embraced the muscularis and the serosa ; careful suturing of the divided mesentery with the same material ; duration of operation seventy-five minutes. No reactiou at all followed the operation. The patient was able to walk about on the ninth day, and improved so rapidly that I was able to present him cured to the Society of the Physicians of the German Poliklinik of New York on May 21st, that is thirteen days after the operation. Until now the patient has gained considerably, and in view of the fact that the growth, which had the size of a small apple, could be extensively extirpated, a relapse may not be expected in the near future. Microscopical examination corroborated the clinical diagnosis.