

open the eliminated portion to the outer world by stitching one or both cut ends into the abdominal wound. The technic of this operation is similar to that of resection. The extirpation of the eliminated portion of bowel at a later date is usually much simpler than resection carried to completion at one time.

An eliminated portion of intestine may be utilized for plastic operation; for example, as a substitute for the bladder.

#### CLOSURE OF THE ABDOMINAL WOUND AFTER OPERATION UPON THE STOMACH AND INTESTINE.

The abdominal wound is usually closed after operations upon the stomach or intestine, but it may be tamponed or drained. The escape of bacteria when the stomach or intestine is opened can rarely be prevented. Furthermore, any suture-line may prove insufficient. Under these circumstances it may be thought better to drain the suspected region, but serious consequences may follow this practice. A tampon changes the normal condition of the organs with which it comes in contact. If a suture is perfect, it makes no difference whether the neighboring parts are deprived by a tampon of visceral and parietal peritoneum. But if there is a weak spot in the suture, the opposing serous surfaces in the immediate neighborhood may form adhesions about the area of infection, which will not only prevent its spread, but will also materially strengthen the suture-line. A tampon may also do injury by setting up adhesions between the suture and other portions of intestine and materially interfering with peristaltic action. The result is stagnation and increase of pressure within the intestinal lumen with the possibility of perforation. If this perforation takes place into the tampon after the surrounding adhesions have become firm, the damage is not great. A larger or smaller intestinal fistula is the result, which will usually close sooner or later spontaneously. If the perforation takes place in the first days after operation, the escaping fecal matter may spread infection in the immediate vicinity of the tampon. Recovery will certainly be delayed, and in many cases infectious material will gradually spread through the abdomen setting up a diffuse peritonitis. For these reasons the use of a tampon for resection of the stomach or intestine and for all sorts of intestinal suture is inadvisable. Experience has shown that the peritoneum can take care of the limited amount of infectious material which reaches it during a properly performed resection of the stomach or small intestine. Drainage should therefore be omitted in uncomplicated cases of this character. If for some reason or other the risk of infection is greater than usual—for example, if gangrenous intestine is resected in the case of strangulated hernia, and the nutritive condition of the sutured bowel is in doubt; or if a great quantity of infectious material escapes into the peritoneal cavity during an operation, or if the peritoneum was infected before operation—for example, in appendicitis—drainage is indicated, but the iodoform gauze should not be wrapped

around the sutured intestine. A single strip of gauze extending to the suture-line will serve as a safety-valve, and will serve to conduct outward a great quantity of secretion.

#### TREATMENT AFTER OPERATION UPON THE STOMACH OR INTESTINE.

The treatment of patients upon whom laparotomy has been performed has been given on page 223. If the alimentary canal is the seat of operation, special attention must be paid to the diet. The higher up the alimentary canal has been opened, the greater the necessity for such attention. Experiments by Chlumsky show that the strength of an intestinal suture diminishes up to the fourth or fifth day, and then gradually increases until by the eighth day it is usually perfectly strong. It should be remembered, however, that every suture-line forms a sort of stenosis which disappears only with the lapse of time, and that perforation may take place many days after operation.

The rules for diet are the same whether anastomosis is made by suture or by a Murphy button, except that the diet should be carefully regulated until the button is out of the intestine.

A patient who has undergone a major operation upon the stomach should receive nothing by mouth for one or more days. Even when this rule is observed, the stomach is not empty, but contains its own secretion, which is often considerable, more or less blood, and frequently regurgitated bile and pancreatic juice. If there are symptoms of retention of gastric contents, they should be drawn off through a stomach-tube. This procedure is much less dangerous than the distention of a sutured stomach or severe vomiting. General rules for diet are unnecessary since the rules for each patient must be made according to circumstances. The first fluid given should be of such a character that it cannot coagulate, such as water, bits of ice, wine and water, tea, weak lemonade, etc. Later the patient receives broth, milk, chocolate, coffee, egg, gruel, etc. Solid food is given in eight or ten days, the first articles being toast, mush, soft eggs, light meat, rolls, etc. If all goes well, the patient receives ordinary diet in about four weeks.

If after one or two days the patient is unable to take and retain as much as 1000 c.c. (2 pints) of fluid nourishment in twenty-four hours, he must be given nutrient enemata. This is the routine practice during the first days after the more severe operations upon the stomach. From 150 to 250 c.c. (5 to 8 ounces) are injected at a time, and the daily quantity should be about 1000 c.c. (2 pints). Wine and water (1 to 4) with a little salt and 10 per cent. of glucose make a good enema. Oatmeal gruel and peptonized milk and the various predigested liquid foods are also employed. If the patient has difficulty in retaining nutrient enemata, the quantity in an enema should be reduced. It should be made of the consistence of gruel and should contain a little opium. A patient thus treated should receive a hot

rectal irrigation every second or third morning. The quantity and specific gravity of the twenty-four hour urine are a good indication of the resorptive function of the rectum. Some surgeons prefer to give artificial foods, but Mikulicz has never found it necessary to resort to them for administration either by the mouth or through the rectum.

The diet after gastrostomy and jejunostomy has been spoken of on pages 423 and 456. After operation upon the lower bowel the patient should receive for about a week a fluid diet to which there will be very little residue. After suture of the large intestine Mikulicz recommends a cleansing enema given by the surgeon himself eight days after operation. Laxatives are given after intestinal suture only in case symptoms of intestinal paralysis appear.

When a fecal fistula is established, the patient receives his regular diet two or three days after operation; and if the bowels do not move spontaneously within a reasonable time, he is given laxatives.

## HERNIA.

BY PROF. DR. E. GRASER.

### CHAPTER XX.

#### HERNIA WITHOUT COMPLICATIONS.

##### SOURCE OF HERNIA AND ITS SIGNIFICANCE.

ABOUT one of every twenty to thirty individuals has a rupture of some sort. The proportion in males is as 1 is to 14.9 and in females as 1 is to 44.7. A large percentage of the cases that are seen for the first time are in children under one year of age; for instance, one-seventh of all cases of inguinal hernia. The minimum number of cases is observed about the fifteenth year of life. From this time on, the number increases, and reaches a maximum in males at about sixty-five years and in females at seventy years of age. Berger found that of 7542 cases examined with reference to heredity, 2079 were positive in this respect, the proportion being about as 1 is to 3.6. Hernia on the right side is much more common than on the left side, especially in males, the difference being most marked in the early years of life.

Several hernias may be present in one individual at the same time. Of 6220 cases of inguinal hernia examined by Berger, 1042 were simple and 4526 were bilateral. Of 829 femoral hernias in women, 506 were simple and 323 combined with other hernias; 213 were crural. There were numerous combinations of inguinal and femoral hernia on the same side (222) and on the opposite side (111).

As far as the hernia is concerned, it may be congenital, especially in the umbilical region, because of defective development. The viscera, however, do not protrude from within outward, but normal retraction has not taken place so that a certain portion of the viscera is left outside. Congenital hernia occurs also in the inguinal region because of insufficient obliteration of the vaginal process. If an oblique inguinal hernia is present at birth, there are usually other peculiarities, such as adhesions between the testicle and the intestine, which developed before the organ descended. In most of the so-called congenital inguinal hernias only the sac itself is congenital. Certain authors claim that the vaginal process is of importance in all cases of inguinal hernia, whereas others claim that it is of no importance whatever and bears no relation to inguinal hernia developing later in life. Without doubt both are in error. The degree of obliteration may vary considerably, but it is uncommon to have a free communication between the vaginal