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# NEW METHODS OF PERFORMING PYLORECTOMY, WITH REMARKS UPON INTESTINAL ANASTOMOTIC OPERATIONS.

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# PYLORECTOMY.

# NEW METHODS OF PERFORMING PYLORECTOMY, WITH REMARKS UPON INTESTINAL ANASTOMOTIC OPERATIONS.



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THE subject of intestinal anastomotic operations to be considered in this paper is to me one of the most interesting in the domain of surgery. So few have been the triumphs of the general surgeon and practitioner in this field in the past, that it is with no little pleasure that we see the pendulum begin to swing in the much hoped-for favorable direction.

The heretofore complicated *techniques* have at least been brought to a state of simplicity, and it is now within the power of everyone, when confronted with the many problems considered by all surgeons in the past so difficult, not only to meet the existing circumstances intelligently, but with the expectation of attaining success. The literature of this special field of surgery is increasing most rapidly, a literature not of failures but of successes; formerly, the failures outnumbered the good results by far.

Starting on the premise that the general principles of anastomotic operations are understood, I will call your attention to two new operations, and suggest improvements in the methods I have already brought to your notice in previous papers.

The first operation to be considered is Dr. Tuholske's

method of pylorectomy. This operation is to my mind an ideal one in many respects, as a trial upon the cadaver will at once demonstrate its feasibility and absolute practicability.

An incision five or six inches in length parallel with the costal margins of the right ribs, or a vertical incision may be used if preferred, over the pyloric end of the stomach. The hand is introduced within the cavity, the great omentum carried upwards and outwards, the jejunum found, and a loop of intestine a few inches from the duodenum brought well into the parietal incision. The abdomen is then packed with flat sponges in the field of operation. The intestine is now clamped, an opening made in the intestinal wall an inch or more in length. A four or six-segmented rubber ring is compressed, passed through this opening into the bowel, the apposition threads passed through the intestinal walls from within outwards, less than half an inch from the margins of the incision in the gut, the needles removed, the threads drawn upon to see that the ring rests well in place. The apposition threads are then seized with pressure forceps for the present. The stomach and duodenum are now clamped at points remote from the proposed lines of excision after pressing the contents on distally. An incision between the greater and lesser curvature, more towards the pyloric than cardiac extremity, is made equal to the incision in the jejunum, a segmented ring introduced and threads passed as described.

The field of operation is now thoroughly cleansed, particular attention being paid to the apposition threads, these being wiped with a bichloride solution. The serous surface in the immediate vicinity of the respective wounds scarified with a needle, the posterior threads tied, next the end threads tied, lastly the anterior. Before completing the tying of the anterior threads, the procedure suggested by Dr. Carson may well be adopted.

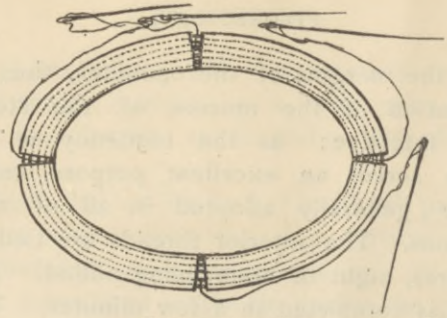
He passes four sutures, one on each side and at each

end, through the margins of the openings, thus favoring a direct co-aptation of the mucosa of the stomach with that of the intestine; as the tendency is to eversion, this principle serves an excellent purpose, and I believe it should be generally adopted in all of the anastomotic operations. The anterior threads are tied last, a few Lembert sutures, eight or more being added. This part of the operation is completed in a few minutes. The pylorus is now brought into the parietal incision, the omenta freed by tying it off between forceps, as suggested by Billroth, the growth excised with scissors, the line of excision through the stomach is at once closed with a continuous or interrupted suture, two or more layers. The free margin of the duodenum is invaginated into itself, a few Lembert sutures being passed through the serous and muscular layers, the parts again cleansed, carefully examined, and abdomen closed.

The entire operation may be done iu much less time than by the unaided suture used in the classical pylorectomy. The operation may be done in two stages if the condition of the patient is found to be precarious, after completing the first step, *i. e.*, the gastro-enterostomy. The pylorus may be removed a few weeks later when the patient has recuperated, and with, most likely, a generally improved state of health. Weir has suggested before opening the intestine and stomach, to attach the intestine to the stomach with a line of sutures passed through the serous and muscular coats before incising and introducing the rings. This will add to the security, does away with any necessity of placing extra Lembert sutures posteriorly after tying the apposition threads, and is a thoroughly practical suggestion. In May, 1889, I devised a method of performing circular pylorectomy with segmented rubber rings, the principle being the same as the circular enterorrhaphy described in a paper read before the Southern Surgical and Gynecological Association, in 1889.

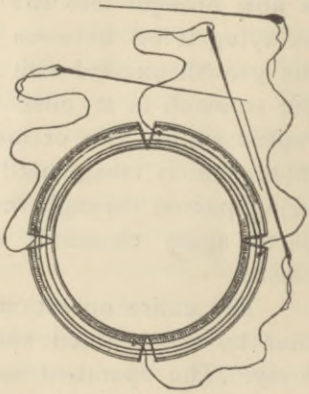
# PLATE I.

FIG. 1.



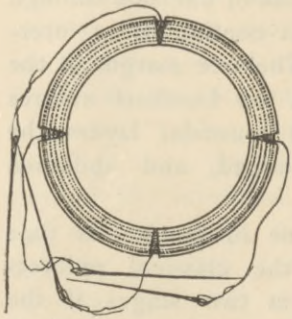
Four segment ring.

FIG. 3.



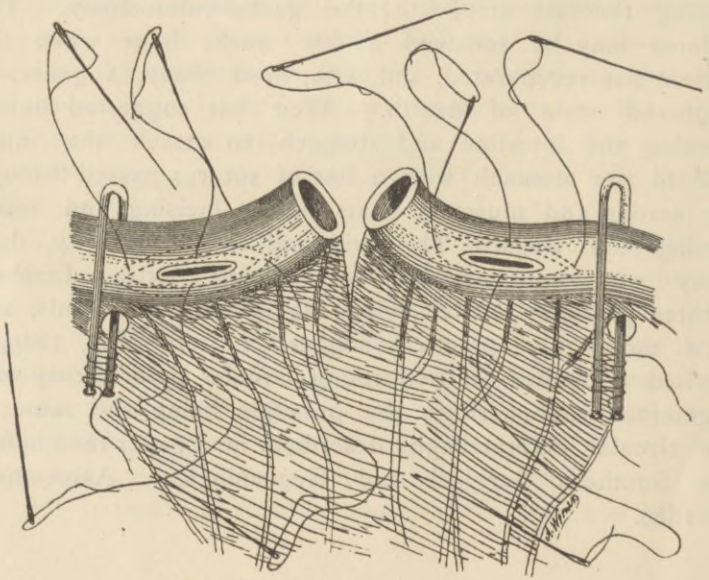
Sectional View.

FIG. 2.



Four-segment ring.

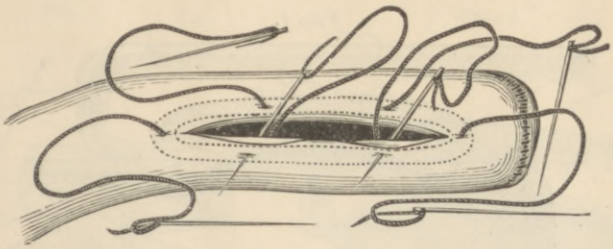
FIG. 4.



Manner of applying rings in enterectomy.

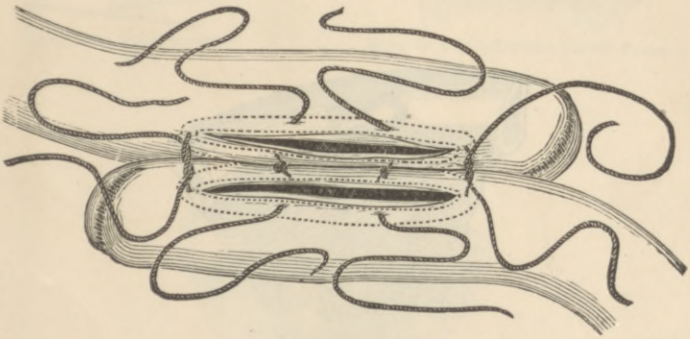
# PLATE II.

FIG. 1.



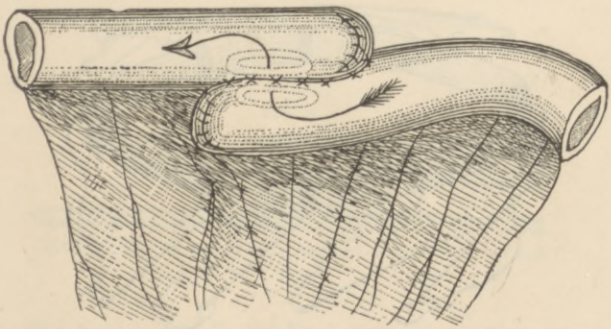
Inserting the ring.

FIG. 2.



Tying the threads.

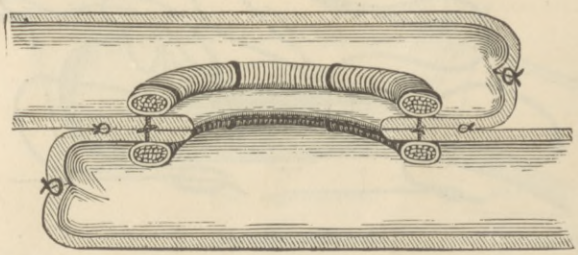
FIG. 3.



Illustrating an anastomosis after enterectomy.

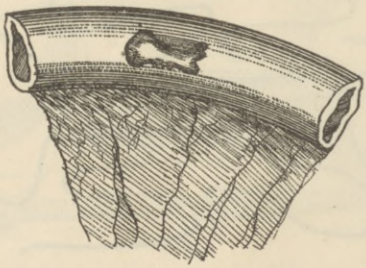
# PLATE III.

FIG. 1.



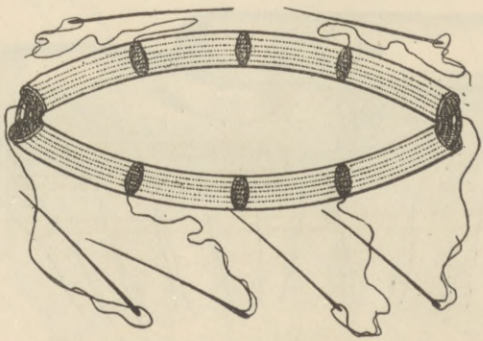
Section through opening and wings in the long axis of the bowel.

FIG 2



Gunshot wound.

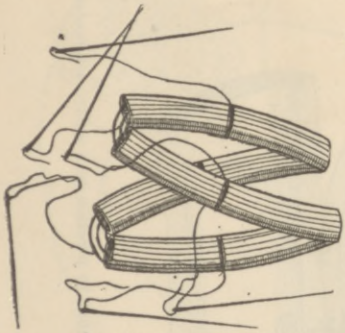
FIG 3



Eight-segment ring used in closing gunshot or other wounds where stenosis would follow suturing.

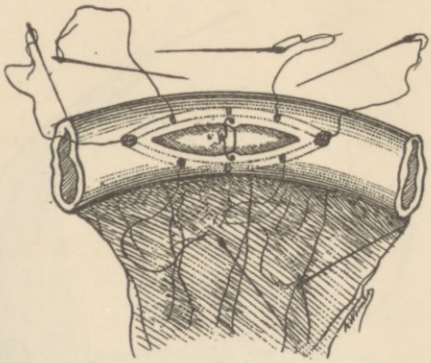
# PLATE IV.

FIG. 1.



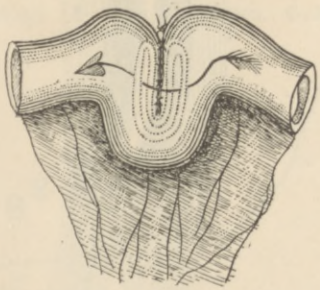
Ring bent upon itself.

FIG. 2.



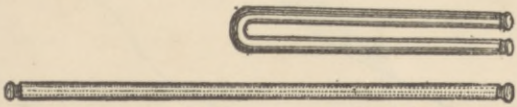
Ring in the intestine before tying.

FIG. 3.



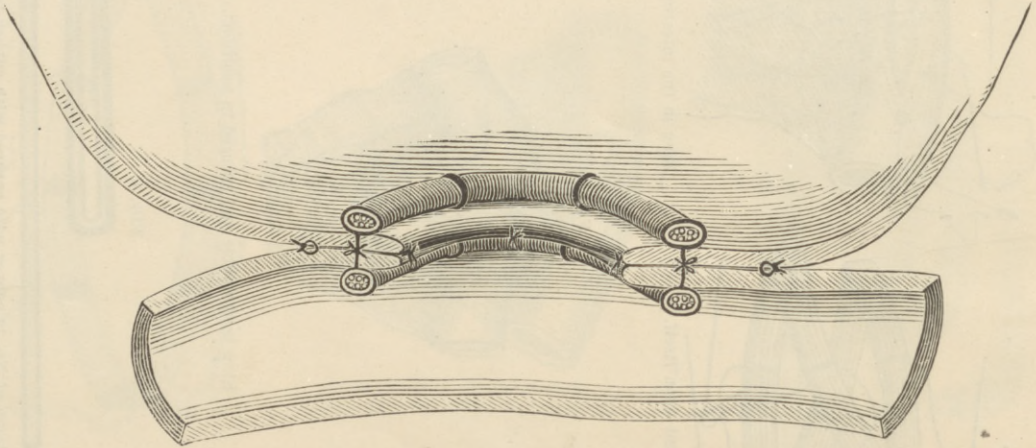
Ring bent double and sutured in position.

FIG. 4.

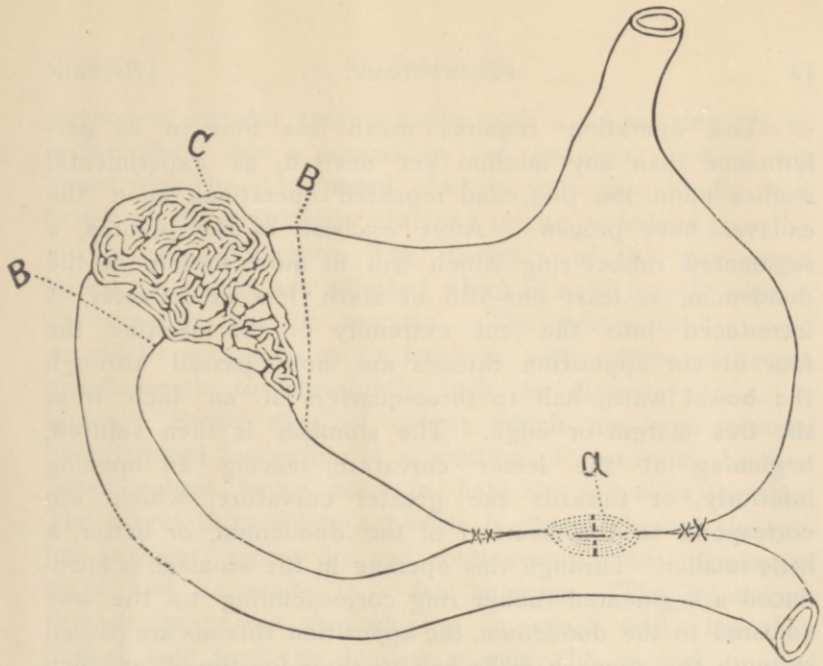


Clamp of No. 12 copper wire covered with rubber tubing.

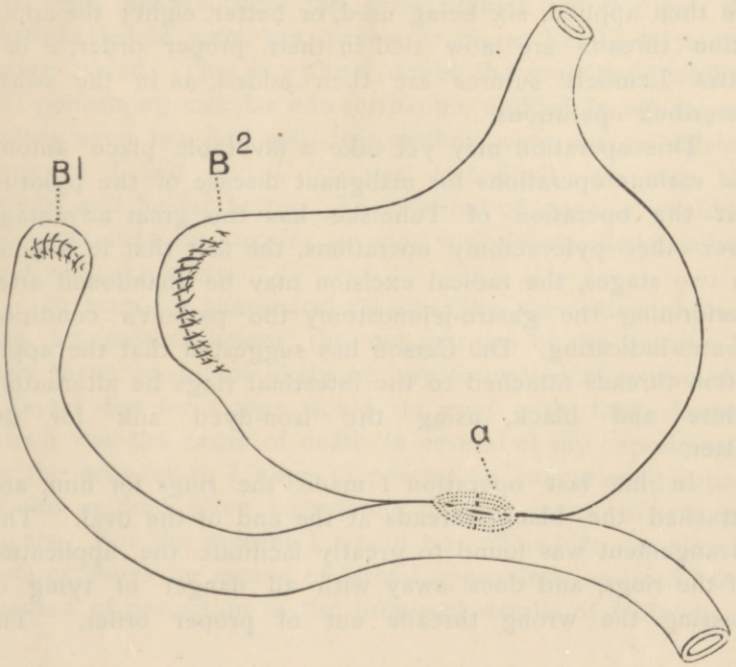
NOTE.—Figs. 1 and 2. Plate II., and Fig. 1, Plate III., are taken from the paper of B. Farquar Curtis on "Knots, Ligatures and Sutures," *Medical Record*, Oct. 26, 1889.]



Longitudinal section of stomach and jejunum, showing segmented rubber rings in position in a gastro-jejunostomy.




*A*—Gastro-jejunostomy. *B*—Lines of Excision. *C*—Malignant Growth.




*A*—Gastro-jejunostomy. *B*1, *B*2—Lines of Excision closed by Lembert Sutures.

The operation requires much less time in its performance than any method yet devised, as experimental studies upon the dog, and repeated operations upon the cadaver have proven. After excision of the pylorus, a segmented rubber ring which will fit quite loosely in the duodenum, at least one-fifth or sixth less in diameter, is introduced into the cut extremity of the intestine, the four or six apposition threads are now passed through the bowel walls, half to three-quarters of an inch from the free margin or edge. The stomach is then sutured, beginning at the lesser curvature, leaving an opening inferiorly, or towards the greater curvature, which will correspond to the diameter of the duodenum, or better, a little smaller. Through this opening in the stomach is introduced a segmented rubber ring corresponding to the one adjusted to the duodenum, the apposition threads are passed through the stomach walls half to three-fourths of an inch from the cut margins. Carson's sutures, previously described, are then applied, six being used, or better, eight; the apposition threads are now tied in their proper order, a few extra Lembert sutures are then added, as in the other described operations.

This operation may yet take a favorable place among the various operations for malignant disease of the pylorus, but the operation of Tuholske has this great advantage over other pylorectomy operations, the fact that it is done in two stages, the radical excision may be abandoned after performing the gastro-jejunostomy the patient's condition contra-indicating. Dr. Carson has suggested that the apposition threads attached to the intestinal rings be alternately white and black, using the iron-dyed silk for the latter.

In his last operation I made the rings for him, and attached the black threads at the end of the oval. This arrangement was found to greatly facilitate the application of the rings, and does away with all danger of tying or passing the wrong threads out of proper order. The

method of circular enterorrhaphy with a rubber ring placed in the distal and a second in the proximal end of the bowel with these proposed changes, will undoubtedly give better results than those obtained in the *technique* given by me in a former paper. The diameter of the gut ascertained, two rings are adjusted which fit quite loosely without any pressure on the mucosa. The rubber tubing used should be soft, such as we have in soft rubber catheters, one-sixteenth to one-eighth inch in diameter (*i. e.*, of lumen). Small sizes of catgut which has been softened being placed for awhile in a solution of glycerine, this prepared catgut being used to hold the segments together. The catgut threaded to a bodkin is passed through the rubber segments repeatedly and continuously. Any number of rings may be made in a few minutes. The apposition threads are passed through the intestinal walls less than half an inch from the divided margin, the second applied in the same manner, the distal end invaginated, the proximal end pushed into the distal lumen of the gut, the threads tied in pairs, ten, twelve or more Lembert sutures being added. This is without doubt the most rapid method of performing circular enterorrhaphy, and while my experiments upon the dog with this method were not as satisfactory as I had hoped (50 *per cent.* died), on man the results will be far better. The amount of stenosis would be no more than by circular suturing with the unaided Lembert or Czerny-Lembert.

In man, for anatomical reasons, the apposition threads can be passed nearer the cut margins of the bowel. In man there would not likely be any formation of enteroliths, a liquid diet for a time would do away with that danger, which was the cause of death in several of my experiments. In the near future I hope to present an encouraging report of this method, after completing a long series of experiments. For the present I would be inclined to do clinical enterectomies by means of lateral approximation until I feel assured of perfection in the proposed details of *technique*.

*Ileo-colostomy*:—A rapid method for doing this operation is the following: The ileum being divided a short distance from its junction with the cæcum, the divided end of the distal bowel is invaginated into itself and secured by a continuous suture, passed only through the serous and muscular coats. Above the proximal end of the gut a clamp is placed. A vertical slit is made in the colon of sufficient length to admit the proximal end of the ileum. A segmented rubber ring with the apposition threads looped, and in each loop a needle; the ring is then introduced through the slit, the apposition threads passed less than half an inch from the margins; the proximal end of the small bowel is held near the slit in the colon. The loops are now cut and only one-half carried through the serous and muscular coats of the small intestines, half an inch from the cut edge; after passing all the threads, the first and lowest being passed close to the mesentric border of the small bowel, the cut end is then pushed well into the slit, the halves of the loop tied, additional Lembert sutures are added. This operation is completed very rapidly, and requires but little time

These rings have been applied by various operators with the very best results, clinically demonstrating their value and practicability.

As a summary of this paper and conclusion from experience it might be stated:

1. The result is the same whether in enterectomy the bowel ends are placed in the direct line of peristalsis or in opposite directions. I prefer the former method of Abbe.

2. Omental grafts are of value, and had better be used if possible.

3. Security of attachment of the apposition threads to the catgut within the ring is of paramount importance.

4. Separation of the mesentery from the gut is always followed by gangrene.

5. Scarification adds to the security and rapidity of union, and should never be omitted.

6. Ordinary raw catgut of medium size is the best variety of gut to use in making rings, though fine catgut may be used. Fine catgut disintegrates rapidly, and may be used especially in the lower part of the alimentary tract, where absorption and disintegration of the catgut is slower.

7. Silk is the best material to use for apposition threads and for suturing. Catgut is thoroughly unreliable.

8. The extra Carson marginal sutures are of the greatest value, adding to the security, preventing stenosis.

9. Carson's plan of using different colored silk, simplifies matters to a great degree.

10. Ileo-colostomy, after the manner suggested, is to be recommended upon the grounds of simplicity of the *technique*.

11. The rapid performance of pylorectomy, after the plan of circular enterorrhaphy with rubber rings.

12. The advantage of the Tuholske pylorectomy over other methods is due to the fact of the operation being done in two stages.