Intestinal anastomosis : with the report of a case / by Frederick Holme Wiggin.

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With the Report of a Case.

BY

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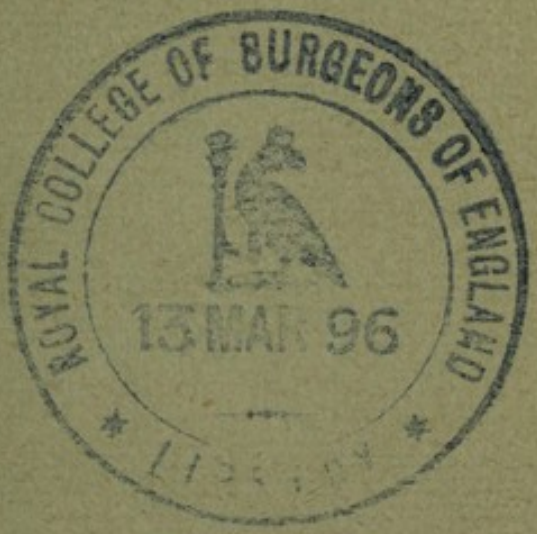

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INTESTINAL ANASTOMOSIS,

*WITH THE REPORT OF A CASE.**

By FREDERICK HOLME WIGGIN, M. D.,

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ETC.

By intestinal anastomosis is meant the restoration of the interrupted continuity of the intestinal canal. This may be effected in diverse ways, many of which have been discarded. In this paper only the modern procedures introduced by Dr. Robert Abbe, of New York, Professor H. W. Maunsell, of England, and Professor J. B. Murphy, of Chicago, will be considered. It will not be necessary to describe the gross technique of either, as this has been so thoroughly done by their originators; but an effort will be made to contrast the methods, and to call attention to some details in their technique of which little has so far been said, but which experience has shown to be of importance. In the medical and scientific world, as in the social world, we are apt to go to extremes, and when new methods are announced we hear for a time only of their good

* Read at the eleventh annual meeting of the New York State Medical Association, October 11, 1894.

points, and as one brilliant result after another is reported at the meetings of societies and in the medical press, we allow ourselves to believe that procedures which formerly required much experience and technical skill, now, by means of these happy discoveries, can be as readily and safely performed by the surgical novice as by the surgeon of experience. Unhappily, we are too often kept in ignorance of the unsuccessful work of our brethren, and it is only by some disaster of our own that we are made aware of some error which might have been avoided had we known that a similar mishap had already befallen some colleague. To be warned of danger is to be able to avoid it. It is by a careful study of the causes of our occasional failures, as well as of our successes, that present defeat is turned into future victory.

It was soon after the disastrous ending of what might have been a brilliant result that I was invited to come before you at this time, and although it would have been more agreeable to record the successful termination of a case of unusual importance and interest, its narration and analysis may prove of greater instructive value.

On May 31, 1894, I was called to see M. L. C., a married woman, aged thirty-four years. Her menstruation began in her sixteenth year, and was of the regular type, without pain. She had had three miscarriages. Fifteen years ago she had an attack of peritonitis. She had been very costive, and had had attacks of colic from time to time. She had not been so well as usual during the week preceding the present illness, and for several days had had pain in the right side of her abdomen whenever she had taken a long breath. She had taken several doses of cathartic medicine the day previous and again on the morning of the 31st, but without the desired result. About half an hour before I reached her, and shortly after she had taken her lunch, she was seized with violent colicky pains in the lower abdomen. I found her in collapse, her bodily temperature being 95·5° and

her pulse 46. Her abdomen was rigid and the pain was violent and in short paroxysms, and was increased by pressure in the right inguinal region. She was somewhat nauseated. It was supposed to be a case of "appendicitis" with perforation, and her removal to a hospital for the purpose of having a laparotomy performed was advised, but was declined.

A hypodermic injection of a quarter of a grain of morphine with a fiftieth of a grain of nitroglycerin was administered at 4 P. M. At 8 P. M. the patient had ceased vomiting. Her pulse was 100 and her bodily temperature was 98·5°. Her pain had been mitigated. At 10 P. M. she was still comfortable, and her pain was entirely relieved. The diagnosis of appendicitis was considered doubtful. At 2 A. M. she vomited fæcal matter, and had severe pain all over the abdomen. At 9 A. M. her pulse was 60, her temperature was 97°, her respirations were 24. Operative measures were once more urged and declined. An enema of eight ounces of a saturated solution of sulphate of magnesium with an ounce of glycerin was administered through a rectal tube. At 11 A. M. a large scybalous movement which completely filled the vessel occurred; the vomiting, however, continued at intervals all day. The pain was general and was on longer localized in the right inguinal region, as it was originally. Late in the afternoon she was persuaded to go to St. Elizabeth's Hospital. At 11 P. M. a consultation was held with Dr. Charles Phelps, her temperature, pulse, and respiration being 97°, 60, and 18 respectively. It was decided that the patient was suffering from intestinal obstruction; that her condition was not at the moment favorable for operative procedure; that she should be stimulated; and that if she responded the operation should be performed as soon as practicable. It was explained to her that the morphine and stimulants would relieve her pain and make her feel stronger, but that the necessity for operative interference would still exist. A quarter of a grain of morphine with a fortieth of a grain of strychnine was given at 11 P. M., and was repeated at 4 A. M. on June 2d. At 5 A. M. her temperature was 99°, her pulse was 100, and her respirations were 24. At 7 A. M., with the assistance of Dr. Charles Phelps and Dr. Parker Syms, the patient was anæsthe

tized and her abdomen, which was much distended, was opened. As soon as the peritonæum was incised about two quarts of straw-colored serum escaped, and the small intestine protruded. The loops of the small intestine were much distended and almost black in color. They were drawn out, and a point a short distance from the cæcum was found to have been compressed by a mesenteric band which had been ruptured as the intestine was withdrawn. The gut showed the mark of pressure. At a point nine inches distant another tight mesenteric band was discovered, which constricted the intestine at that point. This was torn by the fingers. The intestinal circulation seemed to return slowly. At this point the mesentery as well as the intestine was ecchymotic and dark in color. All present were in doubt as to whether the gut could recover itself or not. Had there been only one or even two feet of this discolored intestine the patient would have been given the benefit of the doubt by its removal; but as its condition seemed the same up to the duodenum, all that could be done was to return the bowel to the cavity. Before this was done, however, it was deemed advisable to relieve the intestinal distention, and the gut was opened by a longitudinal incision, and the gas and fæcal matter were allowed to escape. The wound was then closed by Lembert sutures, and before the gut was returned a moderate quantity of a strong solution of hydrogen dioxide was poured over that portion of the intestine in which the opening had been made. Much heat was given off as this solution decomposed, and it roughened the peritoneal coat of the intestines before it could be washed off. The peritoneal cavity was filled with hot saline solution, and the wound closed without drainage.

The time occupied by the operation was forty-five minutes. It was fairly well borne. Stimulants were administered at 9, and again at 10 A. M. At 12 M. the patient's temperature was 98·5°, her pulse was 100, and her respirations were 24. She vomited once, and then but little. During the afternoon nutritive enemata were given. At 9 P. M. her temperature, pulse, and respirations were 100·5°, 100, and 24, respectively. The patient was free from pain and nausea; she urinated freely and slept during the afternoon.

June 3d.—At 4 A. M. by mistake the sister gave a cathartic. At 6 A. M her temperature was 100°, her pulse was 100, her respirations were 24. At 8 A. M. she vomited a little. At 10 and 11 A. M., 12 M., and 1 P. M., powders containing each one tenth of a grain of calomel, with one grain of bicarbonate of sodium, were given. At 4 P. M. a large movement resulted. At 7 P. M. her temperature was 98·5°, her pulse was 80, her respirations 18. The patient retained nourishment, and slept much during the day and passed a comfortable night.

4th.—The patient had a large stool at 5.30 A. M. At 9 A. M. her temperature was 98·5°, her pulse was 80, and her respirations were 24. At 5 P. M. they were 99°, 72, and 18, respectively.

5th.—The patient had remained comfortable and her temperature was normal, and remained so till the 8th of June, when there was a slight rise. The abdominal wound was examined, and it looked a little red. The sutures were removed and were found to be clean.

On June 10th, the eighth day following the operation, the superficial part of the wound was opened, and an ounce or two of fœtid pus escaped, which had a strong fæcal odor. This superficial cavity was syringed out with the strong solution of hydrogen dioxide. On the 11th of June there was no fæcal odor, and the discharge from the abscess was slight. Her temperature became normal again, and remained so till the 21st of June. She now sat up, but complained of pain on passing urine, of some backache, and of a yellowish discharge which escaped from her vagina. Her temperature now ranged from 99° to 102°, and her pulse from 92 to 102. This seemed to be satisfactorily accounted for by the patient's statement that she was subject to malarial chills, and that the time for her menstrual period was at hand. On the 23d she sat up, and complained that this caused pain in the uterine region. She now began to flow, and her temperature subsided. Her bowels moved daily. The sinus in the anterior wall remained patent, but discharged little pus. On the 26th another rise of temperature occurred, and from this time until July 7th it varied from 99° to 102°, and her pulse from 99 to 104. The flow having

ceased, an examination *per vaginam* was made, and a large mass was discovered on the right side and behind the uterus. Pressure on the mass caused some blood and pus to flow into the vagina from the uterus, which was fixed and tender. A consultation was held, and an operation advised and consented to. It was performed on July 7th, thirty-five days after the first operation. Prior to the operation her temperature was 100°, her pulse was 98, and her respirations 20.

An incision was made on either side of the old cicatrix, and the sinus was cut out. The tissues were matted together. The peritonæum was opened with care, and the intestines were found adherent to the anterior abdominal wall. These adhesions were broken up and the wound enlarged with the scissors, the forefinger of the left hand being used as a director. As this was done there came into view a knuckle of ileum which was divided transversely and symmetrically almost from one mesenteric border to the other. There was no fæcal matter in this portion of the intestinal canal. Nine inches from the first solution of continuity a second was discovered, which resembled the first in every particular. The edges did not have the appearance of having been recently cut, and it did not seem possible that they had been cut accidentally in the course of the operation. The points of division corresponded to the points at which the ileum was found constricted by mesenteric bands at the primary operation. The patient being feeble, it was deemed wise to make the operation of as short duration as possible, and the bowels were anastomosed at both points by Murphy buttons. Unfortunately, only one medium-sized button was available, and the second point being near the cæcum was joined by one of the larger size. Its segments were introduced with some difficulty on account of its size. A strong solution of hydrogen dioxide was poured over the intestines at this point. Its decomposition was effected with much rise of temperature, and saline solution was poured over them promptly, but not soon enough to prevent roughening of the serous membrane. The weaker solution does not do this. Many of the intestinal adhesions were now broken up, the bowels were returned to the peritoneal cavity, and a search was made for the

abscess. One was found in the right broad ligament involving the right tube. This mass was removed, but in doing so the sac was broken, and much pus escaped into the pelvic cavity. This was sponged out, and hydrogen dioxide was poured into the cavity; as the patient's strength was failing, some adhesions posterior to the uterus were left undisturbed. The cavity was irrigated with hot sterilized saline solution and the abdominal wound was closed. The duration of the operation was two hours. The amount of ether used was six ounces. Stimulants were administered, and the patient rallied. At 4 P. M. her temperature was 101° and her pulse was 120.

July 8th.—The patient passed a good night, nutritive enemata with stimulants being administered. She passed a fair amount of urine.

There was nothing of interest to record till the 9th of July, at 3 A. M., when the patient vomited fæcal matter freely. Her temperature was 102°, her pulse was 120, and her respirations were 24. At 6 A. M. she complained of a sharp pain in her left lumbar region. At 11 A. M. her temperature had risen to 104°, her pulse was 120, and her respirations were 20. The vomiting continued at intervals during the day. A consultation was held, but it was decided not to interfere further, and the patient died at 3 A. M., July 10th, twenty-four hours from the time fæcal vomiting had begun, and sixty-four hours after the operation.

10th. Necropsy.—The abdominal wound had united primarily. On opening the peritoneal cavity it was found to contain about three ounces of blood-stained fluid. The bowels were somewhat distended, and on the left side, just below the site of pain complained of by the patient, they were adherent to the anterior abdominal wall. Breaking these up, a small perforation was found posterior to the larger button. The lines of union over both buttons were perfect. The intestine here was flexed and adherent, giving rise to the fatal obstruction. At the site of the abscess partially excised at the previous operation there was no sign of infection, but an abscess was found posterior to the uterus under the adhesions that were not broken up previously.

The points of interest in this case are :

1. The severity and sudden onset of the symptoms.

2. The prompt reaction brought about by the use of morphine and strychnine as stimulants.

3. The early onset of fæcal vomiting—eleven hours after the beginning of the attack.

4. The large alvine dejection following the administration of the enema, other symptoms of obstruction meanwhile continuing.

5. The large amount of fluid in the abdominal cavity found at the primary operation.

6. The strangulation of the intestine by two mesenteric bands a few inches apart.

7. The recovery of the intestines, except at the points of constriction, after thirty six hours of strangulation and their having become dark and dull in color, the ecchymosis extending into the mesentery.

8. The fæcal movement thirty-six hours after the primary operation, followed by the immediate fall of the patient's temperature to normal and remaining so for five days.

9. The abscess of the anterior wall, giving when opened a fæcal odor, and none thereafter.

10. The possible independent pyosalpinx (?), the pelvic abscess having no communication with the abscess and sinus in the anterior wall.

11. The adherence of the intestines to the anterior wall, and the mass of adhesions found at the second operation.

12. The bowels symmetrically divided at the former points of constriction.

13. The double anastomosis by Murphy buttons.

14. The perforation posterior to the larger button and the complete closure of this by adhesions.

15. The flexure of the intestine, causing fatal obstruction.

16. The site of the pelvic abscess, which was partly removed at the second operation and disinfected with hydrogen dioxide, and had remained clean sixty hours after the completion of the operation.

Remarks.—In the early diagnosis the writer was misled by the fact that at first no history of previous peritonitis or injury could be drawn out—the attack had occurred fifteen years previously and the patient had forgotten it; also by the absence of vomiting, which is, as a rule, a constant, continuous, and early symptom; also by the presence of right lumbar tenderness and pain, which is usually absent. The mode of onset of this case, with the history of previous peritonitis, of chronic costiveness, of recurrent attacks of colic from time to time, and the sudden seizure after the use of powerful cathartics, was the story of strangulation by bands, which causes, according to Treves, twenty five per cent. of all cases of intestinal obstruction. Opium and strychnine are indeed valuable agents with which to overcome shock, as they proved to be in this case; but care must be taken in their use. The diagnosis should first be fairly considered, and, if clear, the necessity for operative measures should be explained to the patient, and the statement made that the medicine employed will have no curative effect, but will only relieve the symptoms and put the patient in a proper condition to bear what is to follow. Till this is done, the use of opium is dangerous to patient and physician alike. The character of the pain is important. At first it was intermittent, which meant that the obstruction was complete; but this was indicated later when it became continuous and fæcal vomiting occurred. This seldom appears before the fifth day. The large stool following the enema while the ileum was tightly compressed

by bands shows how unreliable is this symptom. In this case only the patient was misled, as the other symptoms continued with unabated severity. Had morphine been administered during this time and the patient made comfortable, her consent to removal to the hospital with a view to operative measures would never have been given. Cruel as it seemed to allow the patient to bear severe pain for hours, it was at that time the best service that could be rendered her.

The large amount of fluid found in the abdominal cavity at the first operation, and the absence of intestinal agglutination with general peritonitis, would tend to confirm the writer's theory that it may be possible to limit or prevent the formation of adhesions by filling and closing the abdominal cavity with the sterilized saline solution—0·6 per cent. The adherence of the intestine to the anterior wall, and the mass of adhesions found at the second operation, notwithstanding the use of the saline solution to prevent them, is of interest. The writer's theory is that they formed after the solution was absorbed, on account of the perforations for the purpose of protection.

In August of this year, at the Carnegie Laboratory, with the assistance of Dr. Titterington, twenty experimental operations on dogs were undertaken, and it was found that twelve ounces of the saline solution could be safely introduced into the peritoneal cavity of a dog weighing from fifteen to twenty pounds; that it was absorbed in from twenty to thirty hours; and that in no case where it was used were there intestinal adhesions, notwithstanding the fact that some portions of the intestines were in most cases drawn out and sponged with a 1-to-1,000 bichloride solution, or a 1-to-20 carbolic-acid solution. In one case they were scraped and the serous coat incised at several points, except in those cases where there was some intes-

tinal complication, such as a failure of a suture, or perforation from one cause or another.

It is not the writer's purpose in this paper to attempt to detract from the brilliancy of Professor J. B. Murphy's invention, or to doubt its utility, but to show, if possible, that it should be used by experienced surgeons with a proper understanding of its dangers, which are numerous. It is, in the writer's opinion, somewhat unsurgical: 1. Because it places in the intestines a foreign body which is occasionally therein retained, and renders necessary a secondary laparotomy for its removal. This happened in an unreported case treated by a well-known surgeon of this city. 2. Because it makes the patient dependent on the craft of the cutler rather than upon the skill of the surgeon, the spring of the button being made at times too strong, and at other times too weak. In an experimental anastomosis in a dog, the spring was so powerful as to cut through all the coats of the bowel and to project into the peritoneal cavity, causing death in fifteen hours. In another case the animal died within forty hours from the same cause. There do not seem to be indications by which it can be known when the instrument is properly constructed. 3. Because there is the trouble of being obliged to have a button or buttons of the proper size, as, in the case reported, a perforation following the use of a button a little too large for the portion of intestine united. This accident also happened in the practice of the surgeon previously alluded to. 4. Because there is danger in the weight of the button, which may act as an anchor to hold the bowel in a flexed position, thus causing obstruction, as happened in the case just narrated. 5. Because there is some danger of the lumen of the button becoming plugged with hard fæcal matter, causing thereby a fatal obstruction, as happened in an unreported case of the surgeon already alluded to. 6

Because there is danger in the holes placed at the ends of the buttons for the purpose of drainage causing a perforation, the intestine being pressed into them and against their edges if care be not used in pressing the segments together. To prevent this accident, a sponge should be placed behind each segment of the button before these segments are pressed together. This accident happened in the course of the experimental work previously alluded to, all the coats from the mucous to the serous, but not including it, being divided.

Experiment proved that there was no practical difficulty in the way, at least in the dog, of uniting the intestine by means of the button at two points nine or ten inches apart if need be, as in this case; or in case of a gunshot wound, or a stab wound, as the following report shows:

On August 24th, a dog weighing twenty-five pounds was anæsthetized, his peritoneal cavity was opened, and a portion of the ileum was drawn out and cut across, and the ends were united by means of a Murphy button. A second point, nine or ten inches distant, was also incised and joined in the same manner. No chemical solutions were used except the sterilized saline solution with which the intestines were washed, and an ounce of hydrogen dioxide. No fluid was introduced into the peritoneal cavity. The external wound was closed. On August 25th the dog seemed well and bright, showed no evidence of pain, and defecated. On August 27th the dog continued well, defecated, and took milk and bread in large quantities. On August 31st the dog appeared to be in good health. Both buttons had passed during the night. The animal continued well up to October 6th, when he was killed, and the peritoneal cavity was opened. The omentum was found slightly adherent to the line of incision; there were no intestinal adhesions except at the points of anastomosis; the lines of union were barely visible, and there seemed to be no contraction. Forty-three days had elapsed since the operation had been performed.

The method of intestinal anastomosis devised and described by Professor H. Widenham Maunsell in the March, 1892, number of *The American Journal of the Medical Sciences*, if not so alluring as that of Professor Murphy, has, to the writer's mind, many advantages over the latter. If the union can not be as quickly effected, it requires for its performance no mechanical device—only a few needles, silk or horsehair for sutures, and experience and general surgical skill. That the method is not as frequently employed as it deserves to be is due to its having been introduced about the same time as the Murphy method, which, from its apparent safety, ease, and lack of special skill required for its accomplishment, has temporarily captivated the medical mind. In time it will be determined which is the better method. The writer believes that in the future the Maunsell method will at least be more frequently employed, if it does not eventually displace the other.

So far the writer can find records of only three operations by the Maunsell method—one was reported by Professor Maunsell in the London *Lancet* of February 13, 1892. The operation was performed in December of 1886, and was for intestinal obstruction due to a carcinoma. Four inches of the ileum were excised, and the ends united according to Maunsell's method. The time occupied was thirty minutes. The patient died on the sixth day, from exhaustion. The necropsy revealed union of segments of the bowel. There was no sign of leakage.

Dr. Frank Hartley, of this city, reported a case of double intussusception and carcinoma, with excision of both; end-to-end union by Maunsell's method; time of operation, thirty minutes. The patient made a good recovery, her bodily temperature not reaching 100° F. (*New York Medical Journal*, vol. lvi, pp. 302 and 464). Up to the present time (1894) the patient has remained well. He remarks:

"To me it seems to be *the* method for enterectomy. The rapidity with which it can be done, and the easy command one has over the hæmorrhage, seem to be the two great points in its favor."

On September 12, 1893, the writer excised six inches of the ileum for contusion and perforation, and joined the ends according to Maunsell's method (*New York Medical Journal*, January 20, 1894). The patient made a good recovery, and had remained well and without bowel trouble when last heard from in July of this year, ten months after the operation. The urgency of this case was great. The patient was in a country farmhouse. The operation could not safely have been delayed one hour longer than it was; consequently there was no time to procure mechanical devices from the city. A few instruments, a paper of ordinary sewing needles—milliners' No. 6—and some iron dyed silk were easily procured, and the operation was promptly performed, and the patient's life was saved.

In this operation there are also some points in which danger lurks, but which with a little practice are easily overcome. 1. Care must be used in approximating the mesenteric border, otherwise sloughing may occur at this point. 2. The sutures should be interrupted, and must not be placed too near the edge of the intestine; they should be placed a quarter of an inch from it at least. 3. The sutures should not be drawn too tightly. 4. Care must be exercised in reducing the invagination after the sutures have been placed not to use much force, or the sutures may cut out. 5. Care must also be exercised in closing the longitudinal incision not to turn in too much of the edges or it may cause a contraction. The difficulties to be overcome are those which skill and experience can control. Dr. B. Merrill Ricketts, of Cincinnati, in reporting a case of anastomosis by the Murphy button (*The Annals of Surgery*, vol.

xix, p. 473), said: "I am satisfied that the Murphy button was the most appropriate in this case, although I am thor oughly convinced that the Maunsell operation is the one to be used in the majority of cases."

In conclusion, the writer can but believe that the best surgery is that which requires the fewest mechanical devices and the fewest special instruments for the accomplishment of its purpose, other things being equal; and the writer's own experience would at this time lead him to believe that Dr. Ricketts is right in saying that the Maunsell operation is the one to use in the majority of cases, and that as time passes it will be better appreciated, as it deserves to be. At present there have been only three cases placed on record, and, as far as the anastomosis was concerned, all were successful. They are too few to build on, but they point the way to a thoroughly surgical, quick, and easy method of intestinal anastomosis, adaptable to any portion of the canal—a method which is perfectly safe in the hands of those who have the proper experience and technical skill. If for any reason a lateral anastomosis is desired, what can be better than the method devised and advocated by Dr. Robert Abbe in the *Medical Record*, April 2, 1892? This, like the Maunsell method, requires no mechanical aid for its execution, and both are exquisite surgical devices.

Appendix.

Through the courtesy of Professor J. B. Murphy, which is hereby acknowledged, and of some other gentlemen, the writer has been able to collect twenty-three cases of intestinal resection in which end-to-end anastomosis has been effected by the button. Some of these cases have not yet been reported. Of these patients, eighteen recovered and five died, giving a mortality of 21·7 per cent. and 78·3 per

cent. of recoveries. If we add to these twenty-three cases thirty three others previously collected by Professor Murphy and published in the *Chicago Clinical Review* in June, 1894, in which thirty-two patients recovered and one died, we get a better result—a mortality of 6·9 per cent. and 93·1 per cent. of recoveries. But it must be borne in mind that in all probability many unsuccessful cases have not yet been placed on record. There were also collected eleven cases of gastro-enterostomy, in which seven patients recovered and four died—mortality, 36·3 per cent., and recoveries, 63·7 per cent.; eleven cases of cholecystduodenostomy for cholelithiasis, in which ten patients recovered and one died—mortality, 9·1 per cent., recoveries, 90·9 per cent.; five cases of cholocystenterostomy for malignant disease, in which two patients died and three recovered—mortality, 40 per cent., and recoveries, 60 per cent.; and one case of lateral anastomosis, in which the patient recovered.

If now we add all of the cases, we get a grand total of eighty-four, of which seventy-one recovered and thirteen died—a mortality of 14 per cent. and recoveries 86 per cent. Of the deaths, two were due to hæmorrhage, six to shock, two to intestinal obstruction, two to failure of the button, due to a wrong-sized button being used, and one to continued peritonitis. In the *Deutsche Medizinal-Zeitung*, Berlin, May 25, 1893, Ramon von Baracz gives the mortality of intestinal anastomosis at 24·5 per cent.

Professor Murphy's Consideration of the Objections raised by Dr. Wiggin to the Button.—The following was received from Dr. Murphy too late to be read at the meeting:

"The statement that the button is a foreign body in the intestinal tract, and may be retained, thereby rendering a secondary operation necessary for its removal, is true, and

it has occurred; but let us ask some questions as to the case to which, I believe, the doctor refers, and some of the particulars of which I have learned indirectly: Why was the button retained, where was it retained, what was the nature of the case, and in how many cases has it occurred? Further, What danger is there, when the case is properly managed, should it occur? In cases of intestinal fistula in which lateral approximation is performed, where a large portion of the fæces escapes through the fistula, where is the current of the fæces? Through the proximal end out of the fistula. The button would therefore naturally fall into the proximal end, and present itself with the fæces at the fistula. If the fistula be closed at the time of the primary operation, the button will be forced with the contents of the intestinal tract on into the distal end to the rectum. If, on the other hand, the fistula be closed after the button presents itself at the opening of the fistula, the contraction of the portion of the bowel which is rendered useless by anastomosis will force the button to the opening, and it will pass on with the contents. The button may be removed through the fistulous opening with proper and careful dilatation of the fistula, an operation which no surgeon would consider of grave importance. Again, it has been retained by a fibrous band in the hepatic flexure of the colon; it produced no symptoms of obstruction, but was found there post mortem. Another case in which it was retained was one of secondary carcinomatous growth of the sigmoid flexure, where anastomosis had been performed higher up; here also there were no symptoms of obstruction. There has not been reported to me, in the one hundred and thirty six cases recorded as already operated with the button, a single case in which the symptoms of obstruction were produced by retention of the button, and only two reported in which the button was retained, also one of

which I have heard indirectly. This would therefore appear to me to be a very small objection, and I can not consent to this objection being of sufficient importance to designate the instrument unsurgical.

"The second objection, that we depend on the craft of the cutler rather than on the skill of the surgeon, is not well taken. We might as well argue that we depend on the silk manufacturer for the silk used; we do, but the cautious surgeon tests his silk; he should also test his button. I have volunteered to examine the buttons for all of the manufacturers. I have sent models to all manufacturers who have requested them, and would gladly inspect, and do inspect, all buttons sent to me for that purpose. I have found a number of reliable instrument houses making perfect buttons. With this advantage, there is no conscientious surgeon justified in using a button unless he knows that it has been inspected or has been manufactured by some reliable house. There are defective buttons on the market; this I am powerless to avoid, as our ethics prevented me from procuring a patent on the button, thereby controlling its manufacture. I certainly do not believe that the fact that defective buttons have been manufactured is a valid argument against the utility of the device. I congratulate the doctor on the result obtained in his experiment of double anastomosis in one sitting. He is the first to use the button in that way, and I see no objection to its use."

55 West Thirty-sixth Street.

RESECTION, END-TO-END ANASTOMOSIS.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	RESULT. R.	RESULT. D.	Cause of death.	Remarks.
1	June 13, 1894.	Not published.	Themones.	Strangulated hernia	Resection, end to end.	Murphy button.	E. to e.	1	....	.....	Button passed 18th day.
2	June 21, 1894.	" "	Cochems, F. W.	Strangulated hernia.	"	"	"	1	....	.....	Resection of 26 inches; button passed 180 hours after operation.
3	June 15, 1894.	" "	McCallum, J. L.	Strangulation of ileum.	"	"	"	1	....	.....	Twelve inches of ileum resected.
4	April 2, 1894.	" "	Dr. Newton.	Neoplasm of mesentery.	"	"	"	1	....	.....	Button passed 14th day. (Small child.)
5	April 7, 1894.	*N. Y. Med. Jour.*, September, 1894.	Dr. Dennis.	Strangulated hernia.	Resection of ileum.	"	"	1	....	.....	Button passed 22 days after operation; wound suppurated; fæcal fistula closed on 27th day.
6	May 12, 1894.	Not published.	Meyer, Willy.	Intussusception; myxosarcoma.	Resection of ileum, 3 inches.	"	"	1	....	.....	Button passed 11 days after operation; perfect recovery.
7	June 16, 1894.	" "	Meyer, Willy.	Intussusception; intestinal obstruction, sarcoma.	Resection of ascending colon, 12 inches.	"	"	1	....	.....	Button passed 11 days after operation; discharged July 24, 1894; died of marasmus, Aug. 14, 1894. Autopsy, multiple sarcoma.
8	June 18, 1894.	*N. Y. Med. Jour.*, September, 1894.	D. Lilienthal.	Carcinoma of transverse colon.	Resection of transverse colon, 6 inches.	"	"	1	....	.....	One and-three-quarter inch (in diameter) button used; passed 18th day without pain.
9	Nov. 11, 1893.	(?)	Ricketts.	Carcinoma of ileum; obstruction.	Resection, end to end.	"	"	....	1	Shock, 10 hrs.	Time for operation, 10 minutes.
10	May 11, 1894.	*Mathews's Med. Quar.*, July, 1894.	Outerbridge.	Carcinoma of transverse colon.	"	"	"	1	....	.....	Time for operation, 1 hour and 45 minutes. Several inches of transverse colon resected.
11	June 23, 1894.	Not published.	Meyer, Willy.	Carcinoma of rectum.	Resection of rectum, 8 in.; Kraske, Rehn.	"	"	1	....	.....	Death, July 22d. Gangrene of lower end of sigmoid with fæcal fistula above line of union, due to tension of meso-sigmoid. Button accomplished purpose admirably; voided on 11th day.
12	June 1, 1894.	" "	Cobb, J. O.	Syphilitic stricture.	Anastomosis around stricture.	"	"	1	....	.....	Death, 14 days later, of pneumonia; autopsy; perfect approximation.
13	Feb. 27, 1894.	" "	Ferguson, A. H.	Cancer of cæcum.	Extirpation of cæcum; 14 in. of bowel.	"	E. to s.	1	....	.....	Patient died 4 weeks later of diarrhœa; autopsy; perfect approximation; opening large as button; diphtheritic colitis.
14	June 17, 1894.	" "	Davis, T. A.	Eviscerating wound of abdomen; laceration of intestine.	Resection, end to end.	"	E. to e.	....	1	3 hours' shock.	Never rallied from shock or injury.
15	Aug. 31, 1894.	" "	Beck, Carl.	Carcinoma of cæcum.	Resection of cæcum.	"	L.	1	....	.....	Ends of intestines sutured; lateral anastomosis with button No. 3.
16	June 4, 1894.	" "	Murphy, J. B.	Fæcal fistula.	Resection, end to end.	"	E. to e.	1	....	.....	Removed 25 inches of small intestine; opening made by button in previous operation had dilated from 3½ up to 5 inches.
17	Jan. 28, 1894.	" "	Middleton, W. D.	Carcinoma of rectum.	Resection of upper part of rectum, 2½ in.	"	"	1	....	.....	Completely cured; button passed on 12th day
18	July 7, 1894.	" "	Wiggin, F. H.	.....	Double anastomosis.	"	"	....	1	.....	Death, 60 hours after operation, from obstruction caused by a flexure in the intestines and adhesions at seat of operation, the buttons acting as anchors to hold the bowel in malposition; line of union at both places barely visible; pressure atrophy nearly complete; posterior to one button was a perforation which was closed by adhesions.
19	July 17, 1894.	" "	Hartley, F.	Intestinal obstruction of five days' standing; gut gangrenous.	Resection, end to end.	"	"	1	....	.....	Button passed on 9th day; patient is well.
20	July 11, 1894.	" "	Abbe, R.	Resection of caput coli.	Ileo-colic.	"	"	....	1	Fatal obstruction; hard fæcal matter.	Fatal obstruction by hard fæcal matter, which plugged the button, notwithstanding ileotomy.
21	April 25, 1894.	" "	Abbe, R.	Union of splenic flexure of colon and sigmoid flexure.	.....	"	S. to s.	1	....	.....	Result good, but button never passed.
22	June 1, 1894.	" "	Abbe, R.	Cancerous growth; resection and recovery of button.	.....	"	E. to e.	....	1	.....	Sloughing of bowel adjacent to the button, due, says the operator, I fear, to pressure of the metal. The button was sent to me by Dr. Murphy.
23	Aug. 18, 1894.	" "	Silver, H. M.	Strangulated femoral hernia; resection of 3 inches.	.....	"	"	1	....	.....	Button passed on the 8th day. Sept. 21st, patient in perfect health; no symptoms after operation.

GASTRO-ENTEROSTOMY.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	RESULT. R.	RESULT. D.	Cause of death.	Remarks.
1	May 5, 1894.	*Med. Week*, Paris, vol. ii, No. 38.	Quenu.	Epithelioma of stomach.	Gastro-jejunostomy.	Murphy button.	L.	1	....	.....	Time for operation, 1 hour and 55 minutes. Uneventful recovery; up in 18 days; great increase in weight.
2	April 19, 1894.	Not published.	Bressler (Baltimore).	Obstruction of pylorus.	Gastro-enterostomy.	"	"	1	....	.....	Death 4 weeks later; exhaustion; button found at splenic flexure of colon retained by band of adhesion; no obstruction.
3	Aug. 13, 1894.	" "	Mayo, W. J.	Carcinoma of pylorus.	"	"	"	1	....	.....	Death 14 days after; broncho-pneumonia; autopsy; perfect union; button liberated; opening about twice as large as button.
4	Aug. 6, 1 94.	" "	Meyer, Willy.	Malignant stricture of pylorus.	"	"	"	1	....	.....	Rapid recovery; discharged August 25 1894.
5	Aug. 23, 1894.	" "	Meyer, Willy.	Carcinoma of pylorus.	"	"	"	1	....	.....	Patient still in hospital, doing well (September 6, 1894).
6	April 10, 1894.	*Buf. Med. and Surg. Jour.*, July, 1894.	Mynter, H.	Carcinoma of pylorus.	"	"	"	1	....	.....	Vomiting ceased; patient left hospital in 3 weeks.
7	May, 1894.	*Ibid.*	Mynter, H.	Carcinoma of pylorus.	"	"	"	....	1	Exhaustion, 12 hrs.	
8	1894.	*Ibid.*	Mynter, H.	Carcinoma of pylorus.	"	"	"	....	1	.....	Smallest sized button used, which could not possibly grasp tissue and was never intended for that purpose. The wall of the stomach slipped out of its embrace and allowed contents to escape. A running suture is not necessary if proper size button is used.
9	July 21, 1893.	Not published.	Middleton, W. D.	Stricture of pylorus.	"	"	"	1	....	.....	Uneventful convalescence; patient gained 42 pounds in year following operation.
10	July, 1894.	" "	Middleton, W. D.	Carcinoma of pylorus.	"	"	"	....	1	Exhaustion, 3d day.	Largest size button used; patient very weak and emaciated previous to operation, from cons ant vomiting. Post-mortem revealed circumscribed peritonitis about site of operation; stomach eroded by a great ulcer 3 inches in diameter; pancreas and other organs involved; approximation perfect.
11	Aug. 1, 1894.	" "	Silver, H. M.	Carcinoma of pylorus.	"	"	"	....	1	Exhaustion, 8th day.	Button was still in position; method of its separation well illustrated.

CHOLECYSTODUODENOSTOMY FOR CHOLELITHIASIS.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	RESULT. R.	RESULT. D.	Cause of death.	Remarks.
1	April 17, 1894.	*Buf. Med. and Surg. Jour.*, July, 1894.	Mynter.	Cholelithiasis; enlarged gall bladder.	Cholecystduodenostomy.	Murphy button.	S. to s.	1	....	.....	Rapid recovery; button passed 22d day; 126 gallstones.
2	March, 1894.	Not published.	Bradley, Peoria, Ill.	Obstruction of common duct.	"	"	"	...	1	Exhaustion, 7th day.	Post mortem; profuse hæmorrhage from liver where it had been torn during operation in freeing adhesions; approximation perfect. Time for operation, 40 minutes.
3	May, 1894.	" "	Bradley, Peoria, Ill.	Cholelithiasis; dilatation of gall bladder.	"	"	"	1	....	.....	One hundred and fifty calculi; button passed 40 days after operation.
4	Oct. 16, 1893.	" "	A. H. Ferguson.	Gallstones.	"	"	"	1	....	.....	Excellent recovery.
5	Feb. 22, 1894.	" "	A. H. Ferguson.	Gallstones.	"	"	"	1	....	.....	" "
6	Mar. 25, 1894.	" "	A. H. Ferguson.	Gallstones.	"	"	"	1	....	.....	" "
7	May 16, 1894.	" "	Clayton Parkhill.	Gallstones.	"	"	"	1	....	.....	Button passed 22d day; convalescence uneventful.
8	July 16, 1894.	" "	G. G. Burdick.	Cholelithiasis, obstructive.	"	"	"	1	....	.....	Button passed 14th day; large calculus allowed to remain in choledochus.
9	Sept. 8, 1894.	" "	Murphy, J. B.	Cholelithiasis; obstruction of cysticus.	"	"	"	1	....	.....	Time for operation, 20 minutes. Difficulty experienced in pressing large calculus from cystic duct back into gall bladder; 60 calculi removed.
10	Aug. 17, 1894.	" "	Middleton, W. D.	Cholelithiasis; obstruction of choledochus.	"	"	"	1	....	.....	Gall bladder found contracted to size of hickory nut, stone half that size removed; obstruction due to fibroid degeneration along entire length of duct; smallest sized button used.
11	Sept. 15, 1894.	" "	Murphy, J. B.	Cholelithiasis; obstruction of cystic duct.	"	"	"	1	....	.....	Gallstone as large as filbert impacted in cystic duct; removed through gall bladder, which was much dilated, full of mucus, no bile. Time for making anastomosis and removing calculus, 6 minutes; time for making entire operation, 16 minutes.

CHOLECYSTENTEROSTOMY FOR MALIGNANT DISEASE.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	RESULT. R.	RESULT. D.	Cause of death.	Remarks.
1	March, 1894.	*Buf. Med. and Surg. Jour.*, July, 1894.	Mynter, H.	Stenosis of common duct.	Cholecystduodenostomy.	Murphy button.	S. to s.	....	1	Prostration,	No peritonitis; perfect adhesions; multiple carcinoma of pancreas and liver.
2	Feb. 2, 1894.	Not published.	King, Ernest W.	Carcinoma of pancreas.	"	"	.....	....	1	4th day.	No peritonitis; cholæmic hæmorrhage from all mucous surfaces of the body.
3	Sept. 29, 1894.	" "	Hartley, F.	Stenosis of common duct.	Cholecystocolostomy.	"	S. to s.	1	....	.....	Patient's temperature normal; button passed on the 15th day.
4	Feb. 20, 1894.	" "	Robert Abbe.	Chronic obstruction.	Cholecystoenterostomy.	"	"	1	....	.....	Good recovery; button passed on 12th day, and patient has remained well; cholecystotomy 4 months previously.
5	Sept. 17, 1894.	" "	Silver, H. M.	Stenosis of cystic duct.	Cholecystoenterostomy.	"	"	1	....	.....	Button not passed up to the 35th day, unless it escaped observation.

SIDE-TO-SIDE ANASTOMOSIS.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	RESULT. R.	RESULT. D.	Cause of death.	Remarks.
1	Aug. 16, 1894.	Not published.	Meyer, Willy.	Fæcal fistula.	Ileo-colostomy.	Murphy button.	S. to s.	1	....	.....	Oblong button used in this case, which passed on 10th day without pain or difficulty.

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INTESTINAL ANASTOMOSIS.

NEW YORK, *December 4, 1894.*

To the Editor of the New York Medical Journal:

SIR: In connection with my paper on Intestinal Anastomosis, published in your journal of December 1st, there appeared a critical examination by Professor Murphy of the objections that I made to his button. Permit me to reply that Professor Murphy's remarks as to the retention of the button in cases of intestinal fistulæ do not apply to the particular case mentioned in my paper, as there was no fistula, and that the second operation terminated fatally was ample proof that there was danger.

The doctor's answer to the second point adds force to the objection and proves it to have been well taken, as it is obviously impracticable to submit all buttons for Dr. Murphy's inspection and approval.

The other objections made seem to be conceded by the inventor, as he has made no effort to answer them.

In collecting the cases of Maunsell's method of intestinal anastomosis it is regretted that a case reported by Dr. Parker Syms in the course of the discussion on the writer's case of Contusion and Rupture of the Ileum (*New York Medical Journal*, December 9, 1893, page 702) was overlooked.

FREDERICK HOLME WIGGIN, M. D.