

POST-OPERATIVE ILEUS AND ILEUS
ACCOMPANYING PERITONITIS.*

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The progress of surgery during the past few decades has been so rapid; the cry for early diagnosis and early treatment has been so rampant, that to discuss a subject that deals with the delayed and even neglected complications of abdominal disease, seems almost superfluous. This verdict applies especially to that part of my subject which treats of ileus accompanying peritonitis. Post-operative ileus is not always avoidable, but there ought to be no cases of ileus accompanying peritonitis. When ileus and peritonitis follow appendicitis for instance, it is evidence that somebody has made a mistake. Even when pus is found in appendicitis, it is evidence that someone has blundered. Yet every now and then, such cases enter our hospitals; cases in which every vestige of the original clinical picture have disappeared, the avoidable complication, ileus and peritonitis, alone being prominent. It is not often the physician nor is it the surgeon who is to blame. It is not infrequently the patient himself or some officious member of the patient's family who interferes or does not send for the doctor early enough.

Given, then, a patient with the symptom of ileus, namely, continuous vomiting, pain, meteorism and coprostasis, whether these follow some operative procedure or whether they are present in an advanced case of peritonitis from any cause, what can we do to prevent a fatal outcome and on what does the fatal outcome depend?

The latter question—On what does the fatal outcome depend—has, in the course of time, given rise to varied discussions. The theory that death in these cases is due to the absorption of toxins, both chemical and bacteriological, has many defenders. That such is the case has not been proven, either clinically or experimentally. In a series of experiments by Dr. McLean and myself,¹ we showed that such toxins could not be demonstrated in the stomach or duodenal secretions, in the serum or in the blood of dogs dying from ileus. Later we showed, that the gas liberated in the intestine of an ileus dog, proved non-toxic to a normal dog. The only conclusion we could arrive at was, that death was due to a depletion of the vascular and

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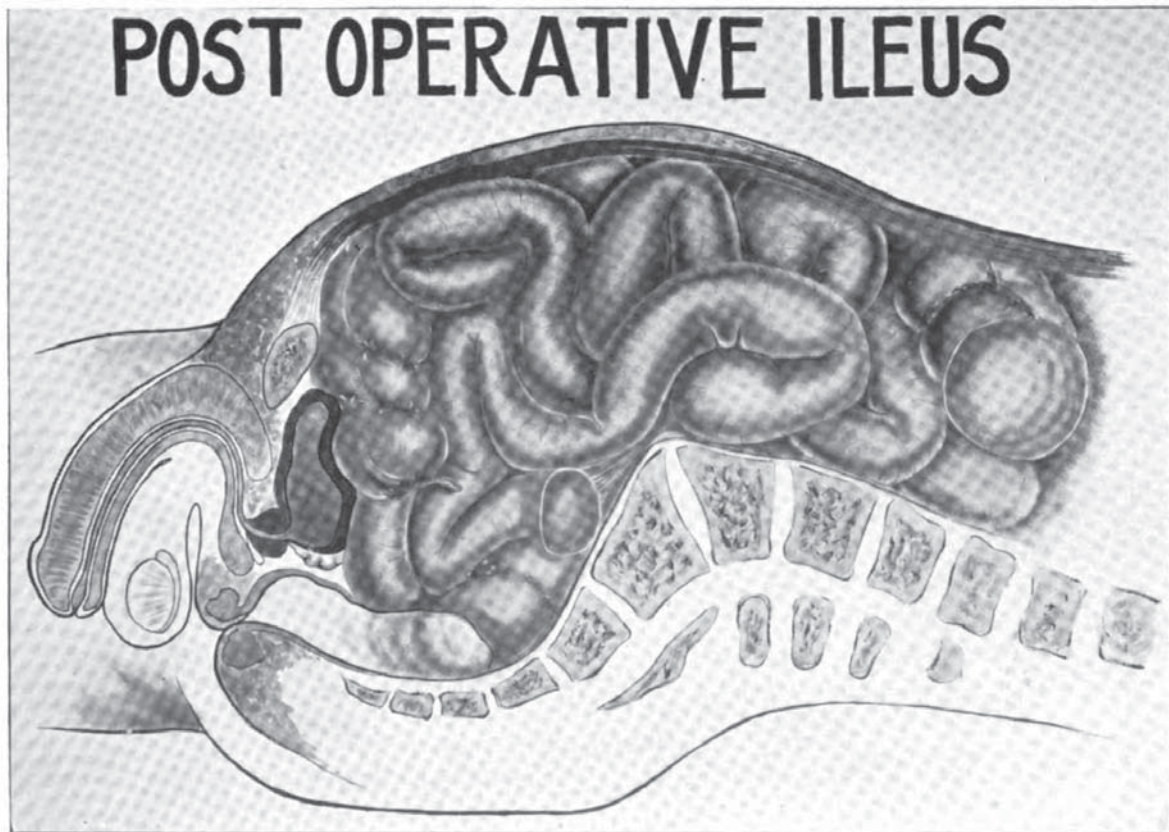
of the American Medical Association, held in Lansing, September 10-11, 1914.

1. Jour. A.M.A., Nov. 2, 1912, p. 1614.

lymph system, causing a grave disturbance in the circulation, especially the cerebral circulation, and that a pathological change in the sympathetic nervous system, a loss of sympathetic control, was probably contributory.

If we look at the clinical picture that confronts us in ileus, we can readily see how there must be a great depletion of the vascular and lymph systems. In the patient suffering with ileus, the abdomen is distended almost to the point of bursting; copious, watery vomiting is incessant, and even after the act of vomiting, the stomach tube will still bring forth large

is the following: The gradual accumulation of gas in the intestinal tract progresses to a state where it produces an overdistention of the musculature of the bowel. This overdistention causes a paralysis, just as overdistention of the bladder causes a paralysis of this viscus. The pressure thus exerted occasions a disturbance in the sympathetic nervous system, a loss of sympathetic control; the abdominal blood vessels become overfilled and the transudation into the hollow viscera begins. The transuded fluids, emptying into the stomach and intestine, finally overflow as vomitus. They are expelled, not so



quantities of dark green or black fluids, all sapped, as it were, from the blood vessels, through the medium of the bile passages, pancreatic ducts and intestinal mucosa. From our experiments we have shown that the amount of fluids thus lost during the course of an ileus death (which for a dog is an average of sixty-seven hours) is equal to about one-tenth of the body weight. Such a loss of fluid is beyond doubt an enormous drain on the system and certainly causes profound depression.

The precise physiological process, by which the enormous transudation of fluids occurs, is to a certain extent conjectural. A plausible theory, however, by which this process can be explained,

much by an act of vomiting, as by an overflowing of an overfilled stomach, as the stomach tube so well demonstrates.

Assuming, then, that depletion of the system is largely responsible for the grave condition of a patient suffering from ileus, is this of an equal importance, whether the ileus is a post-operative condition or whether it is concomitant with peritonitis?

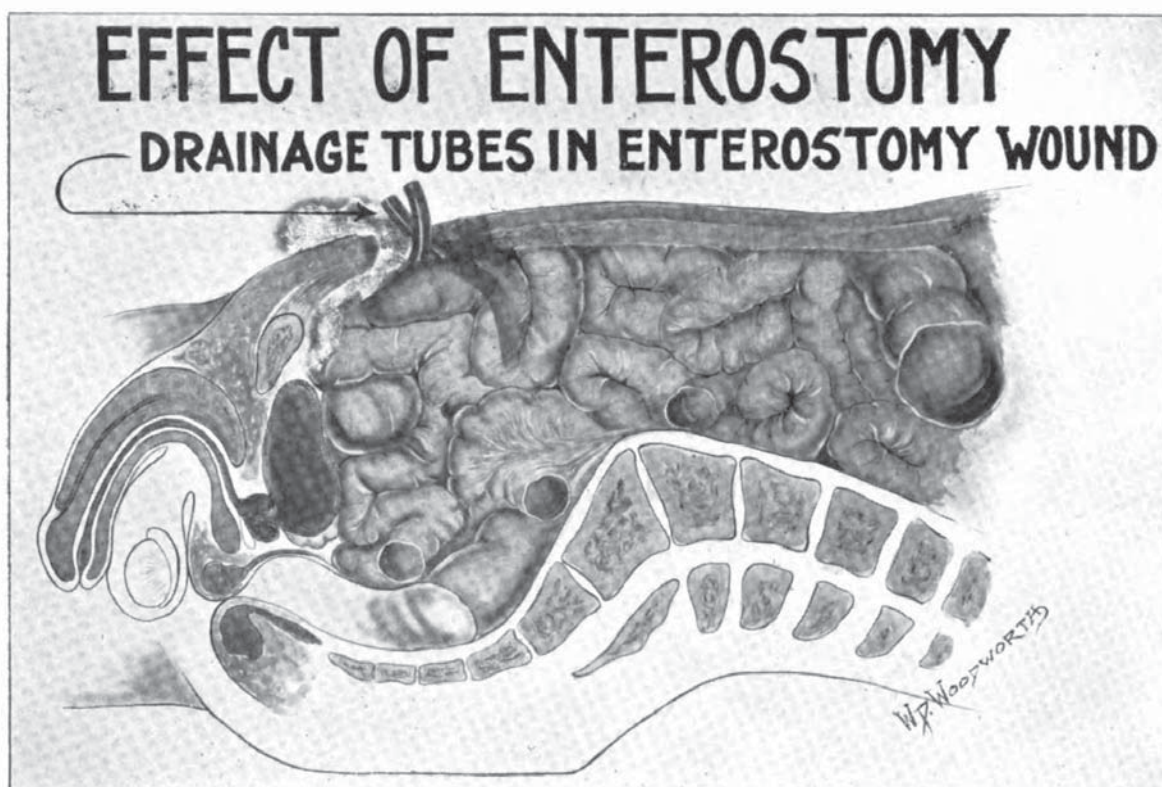
If we compare uncomplicated post-operative ileus and ileus accompanying peritonitis, we find that there is an essential difference. In the former, there is no bacterial inflammation and consequently no absorption of bacteria and their toxins, while in the latter, this element, as can

be proven by cultures from the peritoneum and blood, does enter into the consideration. The same treatment will, however, benefit either condition. It is true that in ileus complicated by peritonitis, the treatment will not cause such an immediate and marked improvement; nevertheless it proves most efficient. A few cases, cited below, will demonstrate this fact.

How then are we to proceed in the treatment of ileus? First of all by prevention. In the post-operative variety, this consists in scrupulously avoiding any procedure that might tend to bring on the condition; such as, prolonged

tion should be made of pituitrin. In our experience one cubic centimeter of pituitrin administered immediately after operation and repeated in about eight hours, has materially reduced the amount of post-operative abdominal distention. What the exact physiological action is, has not been definitely proven; it seems to stimulate contraction. Whatever its action, however, it does cause the expulsion of flatus even during the first twenty-four hours. As a preventive for ileus, it certainly deserves a more universal trial.

Of the simple procedures that often prove



anesthesia, needless exposure of abdominal viscera and extensive manipulation, especially pulling on the mesentery.

As for ileus that accompanies peritonitis, it is imperative to adopt all means at our disposal to prevent peritonitis in the first place. Here the old cry, early diagnosis and early operative interference is the only solution of the problem. Cases of appendicitis should not be allowed to rupture and cause peritonitis and likewise all other conditions that are liable to cause a peritonitis should be diagnosed and dealt with in their incipency, that is, before it is possible for a peritonitis to develop therefrom. Until this is accomplished we will always be called upon to treat cases of ileus.

In the prevention of post-operative ileus men-

useful in combating ileus are, the early administration of castor oil, esserine salicylate, physostigmine, atropin, repeated gastric lavage and enemata. Of these, the last mentioned, gastric lavage and enemata are probably the most important. Ordinarily these should be repeated every two or three hours. If after their repeated trial the condition is not ameliorated, their use should not be persisted in too long, for thereby valuable time is lost and the condition of the patient may be reduced to a state when even a more radical procedure will be of no avail.

At this juncture I wish to state that we cannot and should not treat our patients dogmatically. No two cases are alike. To adopt a general rule and apply it universally eliminates one's personal experience and judgment. Par-

ticularly is this true in ileus. Oftentimes cases that are far advanced and seem hopeless are benefitted by the simple procedure above enumerated. Therefore, to assume, that every case of ileus must be treated by a radical surgical operation is just as wrong as to assume that every case must be left alone and treated medically.

The radical procedure the writer here has reference to is enterostomy or the act of producing a fistulous opening from somewhere in the intestinal tract through the abdominal wall, for the purpose of providing a new outlet for the retained gases and fluids.

To those who have not seen the benefits derived from this procedure, it must indeed seem radical in the extreme. Such, however, is not the case, especially when we consider it a life saving measure and in many cases, a choice between enterostomy and death. Every surgeon remembers well, cases of appendicitis for instance, in which the appendix has been removed, efficient drainage instituted and yet in spite of all, at the end of three, four or five days the patient is still vomiting, his abdomen is still intensely distended, and he is unable, even with the help of enemata to secure an effective bowel movement; when, much to the surprise of all concerned, the patient suddenly feels quite comfortable, vomiting ceases, and pain and distension considerably disappear; all due to the fact that nature herself has formed a new outlet for the gases and transuded fluids that had been locked up in the intestinal tract on account of the inability of the paralyzed gut to propel them to their natural outlet. It is true that the discharges from the wound will have changed from a purulent to a purulent and fecal character, but of what consequence is this when we realize that the critical state of the patient is over; that he, who before was extremely distressed with vomiting and distention, is now at ease and again desirous for food and drink. If nature often accomplishes a cure in this manner, after days of struggling on the part of the patient, why should not the surgeon imitate her in effort, spare the patient needless suffering, and at the same time enormously increase his chances for recovery? This is precisely what an enterostomy will accomplish.

It was stated above that the critical condition of the patient is due to distention, the irritation of which to the sympathetic nervous system, causes a disturbance in the abdominal blood vessels. These become overfilled and the transudation of fluids into the intestinal tract

follows. An enterostomy lessens this abdominal distention almost immediately; with it, the irritation in the paralyzed gut is allayed and the further influx of blood to the abdominal vessels prevented.

At this stage the depletion of the vascular system will have been considerable. This damage can easily be repaired by the free administration of normal saline solution, either intravenously, subcutaneously or by rectum. Hartwell and Houget² well demonstrated the value of saline in sustaining life for three or four weeks or until death from starvation takes place, even in the face of mechanical ileus. By their experiments they have shown that an ileus dog, who ordinarily dies in seventy hours, can be made to live for three or four weeks, by the subcutaneous administration of saline. By so doing they add to the circulation an amount of fluid slightly in excess to that transuded into the stomach and intestine and lost as vomitus. As much as 500 cubic centimeters of saline were injected into a dog daily.

An enterostomy, to be successful in these extreme cases, must be done without added shock to the patient. This can readily be accomplished at the primary operation in cases of peritonitis accompanied by ileus, and in post-operative ileus under local anesthesia, either by separating the edges of the old incision or by making another small opening. Any presenting distended loop of ileum (preferably one near the cecum) can be caught, fastened to the cut edges of the parietal peritoneum by two or three sutures and opened by a small longitudinal incision. Gas and fecal stained fluids will immediately be forced out in large quantities and the relief to the patient is at once apparent. To insure the patency of the opening in the gut, a rubber drainage tube is inserted towards the proximal end. If in doubt as to which end is proximal, a tube can be inserted in both directions.

Closure of the enterostomy wound is undertaken in two or three weeks. By this time the bowel will have fully recovered its tone. Towards the end of this time enemata are usually effectual and in some cases even normal bowel movements occur. If at this time feces cannot be evacuated per rectum, it is advisable to defer closure of the enterostomy wound longer than two or three weeks. It will be remembered that the opening made in the bowel at the time the enterostomy was performed, was only a small longitudinal slit. Simple approximation of the

2. Jour. A.M.A., July 13, 1913.

edges reinforced by a few Lembert sutures is all that is necessary. Occasionally, an enterostomy wound will even close without an operation, just as nature's fecal fistulae usually close spontaneously. It is rarely necessary to free all adhesions; make a wide resection of the bowel at the point of the opening and perform an end to end anastomosis.

CASE REPORTS.

CASE I. Mr. B. G. Age 41; entered hospital with large appendiceal abscess of ten days' duration. His abdomen was immensely distended and he was vomiting continuously.

Operation.—Under gas anesthesia, peritoneal cavity was drained through appendix incision and through supra pubic stab wound. The appendix was not easily found and therefore left *in situ*.

Post-Operative.—For the next ten days patient's condition was poor. Occasionally he would pass flatus and small quantities of fecal matter but there was never a good bowel movement. During this time he vomited frequently. Stomach lavage was of little avail. On the eleventh day, the distention grew still worse and the amount of fluid withdrawn from the stomach immediately after the act of vomiting, increased. An enterostomy was therefore decided upon and performed under local anesthesia. The day following the enterostomy his condition was considerably improved. Vomiting ceased and distention disappeared. Twenty-six days after the enterostomy was performed it was successfully closed under gas anesthesia. The patient left the hospital two weeks later.

Comment.—This patient was in a very serious condition when admitted into the hospital. Had we to repeat the treatment of this case, we surely would perform an enterostomy at the time of the first operation. We believe that the patient's recovery would have been hastened and the eleven days, intervening between the first operation and the enterostomy, all during which time his condition was critical, would not have occurred to retard his convalescence. Cases of this type should always receive the benefits of a primary enterostomy. The long delay in closing the enterostomy wound in this case, was due to the fact, that the bowel distal to the enterostomy reacted very sluggishly. In spite of daily enemata, fecal impactions would recur. It was twenty-six days before the daily enemata were effectual in controlling these fecal impactions. Before closing an enterostomy wound, it is always necessary to procure fair bowel movements at least by enemata. If this point is neglected, a return of the fecal fistula, due to the accumulation of gases which will surely occur, is almost certain.

CASE II. Mr. J. L. Age 21, entered hospital with large appendiceal abscess of three weeks duration.

Operation.—Incision and drainage under ether anesthesia.

Post-Operative.—Subsequent progress of case uneventful for fifteen days, when he again complained of considerable pain. This continued until the nineteenth day when a secondary abscess was diagnosed and drained. On the ninth day following the

second operation, nausea and vomiting set in. Vomiting continued with intervals of considerable belch-inch of gas. Meteorism and obstinate constipation also appeared. Gastric lavage and enemata were employed with only temporary relief. On the eleventh day after draining the secondary abscess (two days after the onset of the ileus symptoms), an enterostomy was considered as the only available means of checking the vomiting and reducing the meteorism. This was done under local anesthesia on the eleventh day after draining the secondary abscess. From this time on vomiting ceased, meteorism disappeared and an appetite for food returned. Ten days later under local anesthesia an attempt was made to close enterostomy wound. This proved only partially successful. After the lapse of two weeks under gas anesthesia closure of the enterostomy wound was successfully performed and the patient left the hospital seven days later.

Comment.—It is now two years since this patient left hospital and he is at the present time enjoying excellent health.

CASE III. Mr. W., age 17, entered hospital four days after beginning of an attack of acute gangrenous appendicitis.

Operation.—Appendectomy and drainage.

Post-Operative.—Three days after operation, nausea and vomiting with meteorism appeared. His temperature rose suddenly and he complained of localized pain in right iliac region. On the fourth day an abscess was diagnosed and successfully drained. Meteorism, nausea and vomiting, however, continued in spite of repeated stomach lavage. His skin was cold and clammy, his expression was drawn and pinched, in fact the whole clinical picture gave the impression of an impending dissolution. On the morning of the fifth day, an enterostomy was performed under local anesthesia. During the next twenty-four hours his condition remained serious, vomiting and meteorism diminished but his skin remained cold and clammy. On about the eighth day he began to improve, he retained fluids and soon ate solid foods without distress. Thirty days after the enterostomy was performed, closure was attempted but a week later fecal discharge again appeared in the wound. This fecal fistula was left unmolested for another two weeks when it was closed through a fresh incision. A new opening was made, the bowel was freed from its parietal attachment, a small piece resected and an end to end anastomosis made. Recovery from this time was uneventful.

The lessons thus learned have taught us to anticipate post-operative ileus and during the past year we have profited thereby, especially in cases of appendicitis complicated by peritonitis in which the cardinal symptoms of ileus, vomiting, meteorism and coprostasis, were prominent. The appendix was removed, if easily accessible; the peritoneum was drained through the appendix incision and through suprapubic and left iliac stab wounds. In addition a distended loop of ileum was stitched to the edges of the peritoneum at the site of the appendix

incision, opened and drained in the manner described for post-operative ileus. The results were surprising. Patients who were delirious, practically moribund and in whom recovery seemed hopeless, survived the operation, rallied and recovered.

In advanced cases, the procedure certainly seems logical, and we heartily recommend it. The surgeon, who unfortunately comes in contact with cases of this nature, can only effect a cure by resorting to primary enterostomy.

The following two cases are illustrative:

CASE IV. Mrs. E. P., age 60, entered the hospital four days after the onset of sudden pain, nausea and vomiting. Nausea and vomiting was followed by distention and coprostasis and persisted until entering hospital. On entering hospital she was still vomiting; abdomen markedly distended, symmetrical distention. Temperature 97, pulse 110, respiratory 28; typical drawn, pinched expression of peritonitis.

Operation.—Under gas anesthesia. A band of adhesion was found kinking bowel about one foot from caecum. This was freed and on account of the paralysis present an ileostomy was performed at the same time.

Post-Operative.—During the first and second day her condition remained critical. During this time drainage of the intestinal contents through the ileostomy wound was scanty. On the third day, the discharge became copious and with it, her condition began to improve and continued to do so. The ileostomy wound was closed on the twenty-fifth day. Further recovery was uneventful. She left the hospital on the forty-fourth day, nineteen days after the ileostomy wound was closed.

CASE V. Master E. P., age 14, entered hospital four days after acute onset of pain, nausea and vomiting. During the four days previous to entering hospital had marked constipation. Upon entering hospital his condition was extreme. Temperature 99, pulse 120 and thready, respirations 30. He was delirious, abdomen enormously distended and still vomiting. His expression was listless and cyanosis was marked.

Operation.—Under gas anesthesia, a gangrenous appendix was removed, stab drainage instituted and a presenting loop of bowel opened and drained.

Post-Operative.—Even the first day his general condition was markedly changed, for the better. Vomiting ceased, meteorism disappeared and a gradual return of consciousness was noticeable. On the tenth day he began to decline and thereafter, in spite of anything that could be done, he grew weaker and weaker and died on the twenty-fourth day.

This case even with a fatal termination, shows the value of enterostomy. As a result of it, the patient rallied from an unconscious and moribund state, continued to do so for ten days and subsequently from want of nourishment finally succumbed from sheer exhaustion. Unfortunately, the enterostomy was performed high up, so that any nourishment he would imbibe, was rapidly discharged through the wound. Absorption, on account of the small area of intestinal mucosa the food would

come in contact with, was insufficient to nourish the tissues. This life in all probability would have been saved, had the enterostomy been performed near the caecum.

CONCLUSIONS.

1. The critical condition of a patient suffering with ileus is largely due to a loss of body fluids.

2. Enterostomy, for post-operative ileus that will not quickly yield to stomach lavage and enemata is a life saving measure. It is really nature's method of effecting a cure.

3. Enterostomy, in advanced cases of peritonitis where abdominal distension is marked, is a logical procedure and deserves universal adoption.

The material used in the preparation of this paper has been taken from the service of Dr. McLean and from the writer's private practice. The writer wishes to thank Dr. McLean for same.