

## ABDOMINAL DISTENTION FOLLOWING OPERATIONS UPON THE PELVIC VISCERA.\*

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THE subject I have chosen is rather commonplace. In presenting it, I may offer the excuse that it has been my aim to make the immediate postoperative period for my patients as comfortable as possible. The distress caused by abdominal distention in patients subjected to laparotomy is often such that some measure for relief must be instituted. It is not uncommon to hear a patient, who is to undergo a laparotomy, ask the question: "Doctor, am I going to suffer much with gas pains?" The laity seems to be fairly well informed on this point. My efforts to bring about a comfortable convalescence after a laparotomy have been somewhat disappointing. The greater number of patients (about 65 per cent. is a fair estimate) have given evidence of abdominal distention with resultant pain that demanded measures for relief. Some patients suffered more than others. In some the distress was of short duration, while in others it was prolonged into a period of marked exhaustion.

In former years I attributed this condition to the improper preoperative care of the patient, and to a lack in surgical proficiency. During later years, however, when no doubt could any longer be entertained as to the proper preoperative care of the patient, and when an increased amount of work, together with better opportunities, made it possible to master certain shortcomings in the surgical technic, I find that but little has been added to the comfort of the patient who has been subjected to a pelvic operation.

It may be stated here that not only does this abdominal distress follow pelvic work, but it may also manifest itself in any and all abdominal operations, even including operations on the kidneys, which are extraabdominal organs. The surprising feature of this abdominal distention is that it may manifest itself with the greatest discomfort in an operation of a lesser magnitude, whereas in an operation of

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greater magnitude, and where such distress might be expected, the postoperative period may be surprisingly free from this phenomenon.

Abdominal distention immediately following an operation often receives but a passing notice from the surgeon. There may be conditions, however, when abdominal distention may assume such proportions as to become a serious matter, and strenuously tax the diagnostic ability of the surgeon as to the correctness of his diagnosis.

Can an uncomplicated abdominal distention following a laparotomy menace the life of a patient?

When the factors at work are fully taken into consideration, this question must be answered in the affirmative. In any event, the condition must be looked upon at all times as sufficiently serious to demand immediate measures for relief. Unless such measures are successful, the patient is in great danger of perishing from toxemia or exhaustion.

It has been a debatable point with me how to properly designate an abdominal distention immediately following a laparotomy, so that its gravity may be more fully appreciated. Paralytic ileus appeals to me as appropriate, because it carries with itself the more serious meaning of the word "ileus." The cause of paralytic ileus, as we meet with it most frequently clinically, is the result of peritoneal trauma. A septic condition is also a common factor; it is, however, not the object of this paper to embody the infection ileus in this argument.

When we say that the cause of paralytic ileus is due to peritoneal trauma, what do we mean? We simply mean that the insult the peritoneum has been subjected to operatively has shown itself in a reflected action upon the small intestine through its delicate sympathetic nervous system, principally through the nerve cells in the plexuses of Auerbach and Meissner. If the trauma to the peritoneum has been gross and extensive, reflexes of an intense character, with their concomitant sequelæ, may be engendered.

How is such a trauma usually inflicted? The invasion of the abdominal cavity invariably means injury of some sort and in some manner to the peritoneum. The surgeon consoles himself that with utmost gentleness in his manipulations of all visceral organs, with sharp dissections and with an acute precision in reaching his objective points, he will be able to minimize the dreaded abuse to the sympathetic nervous system. A pelvic operation, however, is not infrequently one of great magnitude, and the invasion often one of great severity. Gross manipulations may become imperative, carrying with themselves a trauma with the resultant paralytic ileus. The



danger that lurks in the so-called "spreaders," so often used to keep the abdominal walls retracted during an operation for an hour or more, can well be determined during convalescence. The packing away of the intestines with swabs of gauze, or with towels, no matter how gently performed, is always an irritating process, it is a minute trauma. The freeing of adhesions either with the gloved hand, or with gauze, is a serious trauma to the peritoneum.

The severe handling of the mesentery, the ligation of a pedicle, the application of a mass ligature, and the placing of sutures add their quota of injury to the peritoneum. Finally, should the patient's condition, on account of oozing from a denuded surface, demand a gauze packing, we introduce into the abdominal cavity one of the greatest factors responsible for a peritoneal trauma.

The influence transmitted to the intestinal tract by these intrapelvic manipulations is purely reflex in nature, having in its wake either a complete cessation or a partial inhibition of the motor power. Small segments of the intestine may be involved in the paralysis, or the whole of the small bowel may be greatly distended and filled with fluids and with gases. When such a condition exists, neither feces nor flatus are passed. If an enema be administered to such a patient, it is often retained, or is returned with little force and without result in flatus or feces, except perhaps such as may be washed mechanically from the rectum. When we reflect how complicated and extensive the mechanism of intestinal peristalsis is, consisting of a complex neuromuscular apparatus with a large vascular supply, and requiring for its production the integrity of the whole muscular and nervous apparatus of the intestine, it can be readily appreciated how coils of small intestine in a state of marked distention can readily throw this mechanism out of gear. Should such a condition not subside or fail to be relieved, an aggravation of the existing distress ensues, and a toxemia results. This toxemia is the result of stasis of the intestinal contents. Such contents not only consist of the food taken, which is usually very little, but also of the secretion of the various digestive glands. As an instance of the amount of glandular secretion that finds its way into the intestinal tract, it can be said that the salivary secretion alone amounts to one to two pints in twenty-four hours. When there is added to this the secretion of the gastric, biliary, pancreatic and intestinal glands, it can be appreciated how readily a flooded state of the intestines can be brought about.

A stagnant state caused by the arrested peristalsis becomes still more aggravated, because the normal process of absorption of the liquid is interfered with, none of the fluids, on account of the inhib-



ited power of the intestine, being able to reach that part of the bowel where this physiological process takes place.

In the presence of such an inviting pabulum, the invasion of hostile bacteria becomes a matter of a very short time. Myriads of proteolytic, anerobic and endogenous microorganisms harbored in the intestinal tract act upon food products, especially the proteins, amino-bodies and the resultants of a faulty metabolism, forming toxic products known as indol, phenol, skatol, osmotic oxyacids, paracresol compounds, hydrogen disulphide, acetone and diacetic acid. These poisons have a deleterious effect upon the peripheral nerves of the intestine, causing a paralysis in severity conforming to the portion of bowel involved, and to the virulency of the bacterial flora that are present. Should there be no favorable influence at work at this stage to antagonize the further invasion of hostile bacteria, the paralytic ileus will become more progressive. The distended and lengthened intestines, which have been forced into folds, will find it difficult to overcome their angulations; the sudden rise of intra-abdominal tension will interfere with the circulation, and the gases will no longer be absorbed from the intestinal lumen.

As a secondary result of interference with the circulation, a diffuse paralysis caused by the poisoning of the neuromuscular apparatus with toxins found in the stagnant contents will end in marked distension of the gut. We are here approaching a very critical stage of this clinical picture. Assuming that the bowel distension has been progressive, with absolute constipation lasting about five days, it can be expected that the cardiac and respiratory functions will begin to show marked embarrassment. It is very evident that under the strain of the pent-up gas the muscular wall of the intestine is being thinned out, thus robbing it of much of its resisting power. The lowered vital tension can no longer act as a barrier to the hostile microorganisms, and they are free to pass from the lumen of the exhausted intestine through the wall to the peritoneum, giving rise to the most grave postoperative sequelæ, peritonitis and infection.

The recognition of a paralytic ileus does not present any difficulties. It is only when the factors at work seem progressive with apparently no relief in sight, that a feeling of doubt may obsess the surgeon whether or not the condition might be one of mechanical ileus. A careful observation of symptoms and physical signs made from the hour of operation will be of much value in aiding the surgeon in the correct interpretation of the existing condition.

The onset is gradual and usually manifests itself within the first twenty-four hours after the operation. There is absolute constipa-



tion. The patient shows marked restlessness and complains of pain in the abdomen. This pain is diffuse and has the characteristics of an old-fashioned wind colic, being cramplike, twisting or binding. At first, it only gives rise to periods of discomfort, associated with the rumbling of wind which will not pass downward. Later on definite attacks of colic occur, and these become more frequent and more severe. At times, the pain is intense, causing the patient to place his hands upon his abdomen and cry out. He makes an effort to expel the flatus, but is unable to do so, excepting the small quantities of gas that have been forced into the large bowel by pressure.

Palpation of the abdomen reveals a uniform distention with the abdominal muscles more or less on the defensive. There is usually an elevation of temperature of  $100^{\circ}$  and a fraction, with an accelerated pulse, from 110 to 120. At the onset the general condition of the patient appears good. As the distention becomes progressive, the patient's mental anxiety is depicted upon his face, it assumes a worn and worried look, not unlike the facies abdominalis in the more severe abdominal lesions.

In connection with the symptomatology of this condition, I wish to specially allude to vomiting following a laparotomy. It has often been a question with me when the vomiting that can be wholly ascribed to a properly administered anesthetic should cease.

Of course, the temperamental state of the patient, the amount of anesthetic used, etc., are factors to be reckoned with.

It can be assumed that vomiting, which has persisted for twenty-four hours after a laparotomy, can be attributed to some other irritating factor than that of the anesthetic, especially so when there is evidence of abdominal distention, and the character of the vomitus has changed from the bilious to a foul-smelling fluid. The nature of such vomiting must be looked upon as one of reflex irritation, a reflex phenomenon of the sympathetic nervous system, causing a regurgitation of intestinal contents to the stomach. Nausea and severe retching may usher in vomiting in paralytic ileus. However, as long as the patient can remain quiet and is not given any fluids, the less will be the vomiting, though the patient may feel sick. It has been my observation that when a patient vomits frequently and with ease, *i.e.*, brings up a mouthful of dark-colored, foul-smelling fluid without any exertion, the condition of that patient is serious, even though no other symptoms of an apparently alarming nature may be present at the time.

The prognosis of an adynamic ileus is the most favorable of all immediate postoperative complications. It is the persistency of the

symptoms with the increased distress of the patient, and the inability to establish a bowel movement at a time when physiological conditions demand the relief of the alimentary tract, that the situation becomes at all alarming. The patient, as a rule, is relieved of his abdominal distention within five days. It may happen, however, that the measures for relief fail and that death may ensue from a toxemia or from exhaustion.

Much can be said relative to the treatment of a paralytic ileus, but still more can be said relative to the prophylactic measures, which, when properly carried out, will do much to mitigate this distressing condition. The careful preparation of a patient for abdominal section is not to be underestimated. Patients with surgical lesions of an acute nature, where operative measures must be immediate, are an exception. With a patient, however, where the lesion is not acute, a preparatory treatment of at least a week is desirable. The preparatory treatment is purely hygienic in nature, with special attention to diet and to the organs of elimination.

It is to the surgeon who performs the abdominal section that we look for the comfort of our patient. If the operator is rough in the handling of the organs, if he exposes the intestines without the proper protection, tears and pulls at adhesions, with a surgical execution of the slam-bang type, then almost anything may be expected during the postoperative period. When the surgeon, however, exercises that delicacy and gentleness of touch in his work that human organs and tissues should be accorded, if he exposes only that portion of the intestinal tract which is necessary, and keeps the exposed coils covered with a gauze pad moistened in warm saline solution, if his dissections are made with precision and with the least amount of mutilation of the tissues, his hemostasis that of a finished surgeon, such a patient is being given every possible chance for a comfortable postoperative convalescence.

It appears to me that a paralytic ileus could to some degree be anticipated, viz., a stomach lavage given before the patient is removed from the operating room. This is especially indicated when the operation has consumed considerable time with the patient in the Trendelenburg position; twenty-four hours after the operation the administration of calomel with a liberal quantity of bicarbonate of soda, and a fraction of pulv. opii, to be followed twelve hours later with a saline draught and a stimulating enema, may establish an active peristalsis with the resultant bowel movement and the expulsion of the pent up flatus. When such a happy condition is once established, the patient's convalescence will not be harassed by gas



pains of any severity. Gas pains of a mild nature, however, may manifest themselves at intervals. If the condition is one which has progressed to an extreme paralytic ileus and the measures just mentioned have failed to produce a bowel movement, or the expulsion of an appreciable amount of gas, it becomes imperative that a systematic régime in the hands of a competent nurse be instituted and continued till results are obtained. The administration of purgatives, although not contraindicated in the full sense of the word, will be of little avail because the patient in most instances will not retain them.

The most encouraging measures at our disposal are embodied in the stomach lavage and in the enema. The former should be used every four to six hours while the patient continues to vomit, whereas, for the latter, it may be said that our greatest hope rests here. Fortunately, disappointments have been few. In my hands, the alum enema, as advised by Hardon, slowly introduced into the rectum every two hours, if necessary, has proven so efficacious that I have given it the preference over all enemata. It must be borne in mind, however, that the alum enema is only given to remove the flatus, and that it may require several days of persistent work to accomplish this. Fortunately, the alum is not irritating to the bowel, so that a large number can be administered provided the nurse exercises gentleness.

While awaiting results from the alum enemata, it is well during the interim to occasionally administer a stimulating enema of soap suds with the addition of turpentine. This enema should be introduced as high into the bowel as possible, and the quantity at least a pint. A stimulating enema should not be repeated too often on account of the severe tenesmus it may cause. An enema of olive oil with an admixture of glycerin, or one of magnesium sulphate solution prove excellent substitutes. Of drug medication hypodermically administered, especially of eserine salicylate, and pituitrin, I cannot say that they have given me sufficient encouragement in the treatment of intestinal paresis to feel at all positive of their efficacy. There have been instances where flatus was expelled in enormous quantities after eserine had been administered. This, however, happened in connection with the alum enema régime, making it difficult to correctly judge the action of the drug.

With the administration of pituitrin, I have had a similar experience, this drug also having been given in connection with the alum enema. My experience with pituitrin has been limited to eight



cases. It may be said, however, that its administration has favorably influenced the vomiting in five of the eight patients.

Two remedies whose therapeutic values must not be underestimated in combating a paralytic ileus are strychnia and codein. Through their judicious administration, the exhausted organism is often given renewed tone and strength, factors highly essential in overcoming so nagging a condition as an abdominal distention following a pelvic operation.

#### DISCUSSION

DR. HUGO O. PANTZER, Indianapolis.—The importance of the subject presented by Dr. Reder is apparent. I wish not to detract any from the statements and practices narrated by the essayist. Postoperative distention with me is practically ruled out. Faulty use of adhesive straps is the cause of a great number of these cases. A light touch of the abdomen, saying nothing of a painful one, causes the underlying parietal musculature to contract; and this in turn affects the underlying intestines. Adhesive straps put on too tightly, or slantingly so as to pinch the skin, or put away around the abdomen, result in compression and spastic contraction of the intestines immediately underlying such pressure. When morphine is used in an effort to relieve gas pains and distention so created, the distention is increased, paralyzing the intestinal musculature. The interrelation between the offensive adhesive strapping and the gas pains is easily demonstrated. Loosen the offensive straps and the patient will report relief at once. In single instances, gentle massage of that part, or of the entire abdomen, or when necessary turning patient in bed, to the right, and back, and to the left and back, will commonly suffice to shift the gases and give relief. A pint of salt-water is given by enema every hour, as I have no doubt many surgeons nowadays are giving. The drop method should not be resorted to in cases tending to intestinal distention. It fails of the desired gentle stimulation of peristalsis. If the douche-bag is placed 5 or 6 inches above the nozzle in the rectum, the force is sufficient to produce a gentle stimulation of the mucosa; enough to wean down gently gases and fecal matter and not enough to unfit the rectum for the retention of the fluids. Whenever the patient complains of distress the enema is discontinued for the while, and the patient told to evacuate. Where this effort of the patient fails, a low Watkins enema is given. Within fifteen minutes after gases or feces are discharged, the nutritive enema is resumed. If the distention does not yield to these remedies, physostigmin or pituitrin hypodermically is given, followed by low Watkins within fifteen to thirty minutes. For the later stages, podophyllin has served me well. Given in 1/10-grain doses, three times daily, it commonly keeps the bowels nicely open and the secretions stimulated. These procedures methodically carried out from the first, anticipate and obviate distention.



DR. GORDON K. DICKINSON, Jersey City, New Jersey.—All roads lead to London, some quicker than others. That adhesive strapping promotes gas pains I can hardly believe, because I have used adhesive strapping dressings for a number of years and very rarely had gas pains following. The so-called gas pains are generally produced with the traumatism of one's hand and not with the traumatism of the apparatus upon the abdomen. In my cases of instrumental surgery my intern says, "I was not up last night with that patient." In some cases, like inflammatory cases, I may have to use the hand and manipulate, and my patient may have gas pains, and my intern has to get out of bed during the night. For the relief of these pains we give pituitrin and give it promptly and expect relief right away. We may not only have evacuation of the bowels but of urine. If the thing continues, there is one thing that has not been spoken of in any of our societies, and that is the use of the Kemp tube. There is nothing more reliable than water at 120° as it passes into the rectum, keeping up the heat by a hot-water bag held over the tube and running it for at least twenty minutes. You can activate the bowel, the kidney and skin, and consequently promote sleep. Sometimes I turn these patients over on their stomachs as I would a baby and have general compression which gives relief.

DR. FRANK D. GRAY, Jersey City.—I would like to emphasize what Dr. Dickinson has said in regard to the efficiency of the Kemp tube at intervals. I have had practically the same experience he relates. I would like also to suggest another form of enema which has not been mentioned, and which I have found very effective in cases of abdominal distention. It is not original at all with me; it was original with the elder Senn, and that is milk and molasses, a pint each. It is very effective in reducing distention.

I would go a little further in regard to the use of pituitrin and would give it as a prophylactic before we have gas pains. I usually administer it in doses of 1 c.c., two or three times a day, to those patients immediately after operation for two or three days. It is very effective in preventing gas pains.

There is one point I wish to make in regard to the type of ileus in these cases. It is a question if they are always cases of paralytic ileus. We lose sight of the possibility of spastic ileus. I have operated on two cases within the last two years with great distention, with all the symptomatology of intestinal obstruction, expecting to find an organic obstruction. In both cases I found nothing pathologic except spastic contraction of certain areas of the ileum. In one case there was a spastically contracted gut about 18 inches in length, the size of my little finger, and in the other case, instead of it being a continuous spastic contraction, it was a series of several contractions each about 4 or 5 inches long. Both of these patients made uneventful recoveries.

DR. WILLIAM E. DARNALL, Atlantic City, New Jersey.—I have often wondered just how much effect a nervous temperament has to do with abdominal distention. I quite agree with what Dr. Reder has said in his valuable paper and with the other gentlemen who



have spoken; but we surgeons are so in the habit of looking for the tangible things we sometimes forget the other side—the psychological. I do not doubt the experience of every one of you gentlemen has been the same as mine. Oftentimes when we take a phlegmatic ward patient and do an extensive Werder operation or Wertheim or something of that sort, we are surprised at how very little distention the patient gets. The patient is comfortable the next day. On the other hand, if we take the high-strung, nervous society woman, of neurotic type, she is frightened to death, and in a state of terror when she goes to the hospital. The operation may be a very simple one where you have not used any trauma or had to pack off the intestines, but the next day you find her all ballooned up with gas, crying and hysterical. The operation has probably been the simplest kind you could do. Just how much effect the neurotic temperament has in distending that intestine I do not know. It is a thing I have observed quite frequently, and what I have said is only in the nature of a suggestion.

DR. JOHN NORVAL BELL, Detroit, Michigan.—I admit that I have had trouble with dilatation of the stomach and with gas pains after abdominal Cesarean section work, as I think most of you have. I have used pituitrin in three cases and my patients have had a less stormy convalescence since I have used it.

The point brought out by Dr. Gray of using pituitrin as a prophylactic might apply in the average abdominal work, but in Cesarean section we must bear in mind we may kill the baby by using pituitrin too soon. I used pituitrin in one case when I started to operate; the uterus was markedly pallid and white, so there is danger of shutting off the circulation and killing the baby if you use it too soon.

DR. ROBERT T. MORRIS, New York City.—We have to go at this matter in a fundamental way and realize the relationship between tonic ileus and atonic, and place them both upon the basis of splanchnic influence. You have first a toxic overstimulation of the splanchnics, then you have tonic ileus; then exhaustion of muscularis and atonic distention.

In regard to the treatment of the latter condition, I quite agree with Dr. Dickinson and Dr. Gray as to the value of the Kemp tube and massage and posture. They said little of posture, but if we place the patient upon the abdomen, we get distinct mechanical value. Improvement may sometimes be noted in fifteen minutes. The use of Kemp's tube and massage is very important, and at other times the old alum enema that most of us have forgotten is of value. An ounce of alum to the quart of water gives a rapid exudation of secretion from the mucous surface of the bowel very much as alum placed in the mouth causes a rapid action of the parotid glands or the secreting glands in that vicinity. These points I believe are practical as we see them in everyday work.

DR. J. HENRY CARSTENS, Detroit.—I cannot agree with Dr. Pantzer about the strapping. I never sew up the skin, I plaster it together. I do not shove microorganisms under the skin into the wound, but strap it up tight, sewing up the fascia only with catgut.



If I do not put plaster on there I cannot bandage it tight enough because some of our patients will dispose of catgut in three or four days, while in others it will stay in for two or three weeks. I do not have these troubles from distention unless I have sepsis. When I have a case of abdominal distention I know I have sepsis to deal with, and if there is no sepsis I do not get distention. If there is distention, I may find a stitch abscess before I get through with the case.

DR. REDER (closing).—I appreciate very much the interest that has been taken in the subject presented to you. I rather hesitated to bring this matter before the Association for fear I might be considered as looking at these conditions too seriously. As I have previously stated, the loss of two patients from what appeared to be an abdominal distention, the postmortem examination revealing nothing pathologic to which death might be ascribed, prompted me to present this subject. Strapping of the abdomen has been alluded to by Dr. Pantzer. I wish to state that in both instances the operation was a vaginal hysterectomy. No strapping of abdomen, of course, was necessary, there being no abdominal wound. If vomiting does not interfere with the taking of food, such as toast or crackers, this measure should be encouraged as soon after the operation as is consistent, that peristaltic action might be encouraged.