

DYNAMIC ILEUS FOLLOWING OPERATIONS INVOLVING THE ABDOMINAL CAVITY, WITH REMARKS ON ADYNAMIC ILEUS.

By F. BLUME, M.D.,
ALLEGHENY.

INTESTINAL obstruction following operations involving the abdominal cavity has within the past few years been frequently the subject of discussion in societies and journals. Quite a number of cases have been reported, and from the evidence which they present we are led to conclude that this grave complication is by no means of such rare occurrence as hitherto believed, and that it demands our earnest consideration to correct old views and to establish more precise indications, which may guide us in diagnosis and treatment.

A decided progress in this direction was made when Olshausen¹ in 1887, in an article read before the Berlin Obstetrical and Gynecological Society, called attention to a form of intestinal obstruction which had not yet been recognized, a paralysis of the intestine not dependent upon septic peritonitis. The symptoms in these cases are: temperature normal or but slightly elevated, in some instances even subnormal; pulse-rate increased, some vomiting. On the second or third day after operation, or even later, the symptoms of collapse manifest themselves. The pulse is rapid and feeble, the abdomen becomes more and more distended, retching and vomiting more frequent. Neither gas nor feces are expelled by the rectum. The general condition of the patient during the first few days appears to be good. Nothing is observable by which the development of so serious a complication can even be suspected until the abdominal symptoms become more pronounced. Death ensues between the fourth and tenth day after the operation,

¹ *Zeitschrift für Geburtshilfe und Gynäkologie*, vol. xiv. p. 619.

and results from intoxication of the decomposed intestinal contents. Post-mortem examination reveals the absence of peritonitis. Olshausen sees in prolonged eventration of the bowels an important etiological factor of this condition.

Notwithstanding the fact that competent observers have confirmed the investigations of Olshausen, there is still difference of opinion in regard to the causes of this variety of adynamic ileus. The opponents of this theory are not satisfied with the ordinary post-mortem examination; they insist on bacteriological examinations to exclude sepsis. It is not my intention to enter upon a discussion of this theory. I will but briefly refer to an interesting article of Otto Engstrem,¹ published this year. This author gives his experience with four cases of intestinal paralysis following abdominal operations. Every one of the patients died, although in two of them a secondary operation was performed. Post-mortem examinations showed the absence of peritonitis. In the last case a careful bacteriological examination was made with negative result. Reviewing the investigations of other observers, he arrives at the conclusion that paralysis of the intestines can and does occur after operations involving the abdominal cavity without infection at the time of operation. Eventration and prolonged manipulations of the bowels are the most potent etiological factors, causing irritations of the nerves of the mesentery and the gut-wall, and leading to changes in the circulation. From his own experience he can confirm the statement of other observers that a paresis of the intestinal wall can be produced by strong saline purgatives, and it appears to be by no means impossible that, as a consequence of their use, a weakened condition of the gut-walls is created before the operation. He looks upon the increased susceptibility of the nervous system, often so marked in patients before operation, as a predisposing etiological factor.

There is hardly a surgeon who cannot recall a case in which the symptoms described above presented themselves, where the prognosis seemed to be favorable during the first few days, and which ended fatally from intestinal obstruction before a week had passed by. The diagnosis remained uncertain; even the autopsy did not give a satisfactory explanation. Such a case came under my ob-

¹ *Ibid.*, vol. xxxvi. p. 399.

servation in April, 1896. The patient from whom I had removed a right pyosalpinx was very restless after operation, and could scarcely be managed. General condition good on the second and third day. In the middle of the fourth day the symptoms of intestinal obstruction developed; temperature 99° , pulse 130. Peristalsis was perceptible from the second to the fourth day. Collapse in the morning of the fifth day; temperature $97\frac{3}{4}^{\circ}$, pulse 142. Death toward the end of the fifth day. Autopsy: the intestines enormously distended, their peritoneal covering slightly injected, but otherwise normal in appearance. No adhesions, no evidence of peritonitis. This post-mortem examination made a deep impression upon me.

I have presented to you this brief sketch of one type of adynamic ileus to bring out certain points and conditions which more or less are associated with every form of intestinal obstruction, and to which reference will have to be made repeatedly later on. It may serve, therefore, as an introduction to the study of dynamic ileus, to which I now invite your attention.

The first case of dynamic ileus following operation which I have been able to find in the literature at my disposal, occurred in 1887 in Olshausen's clinic, and was published in 1888 by P. Reichel,¹ one of his assistants. It was a case of vaginal hysterectomy for cancer of the cervix uteri. The patient did well the first days. No rise of temperature. Nausea, but no vomiting. The pulse-rate remained above normal, and increased to 140 on the third day. Abdomen distended, marked peristalsis, visible through the thin abdominal walls. No gas or feces expelled by the rectum. Enemata and stomach-washing gave no relief. The abdomen was opened on the seventh day. The small intestines were greatly distended, their serous coat strongly injected, but smooth and glistening. The lower part of the ileum, about five inches from the ileocecal valve, and a portion of the mesentery were adherent to the vaginal wound. On separating the adhesions three to three and one-half inches of this part of the bowel were found to be firmly contracted, resembling a solid cord. All efforts to move the intestinal contents along by compression, and thus dilate the contracted portion, failed. The patient died on the table.

¹ *Ibid.*, vol. xv. p. 87.

Numerous cases of intestinal obstruction after operation have been observed in which the ante- or post-mortem examination showed that a few inches of the gut were "collapsed" or "contracted." Either a constriction by peritoneal bands, or an acute flexure, or some other mechanical obstruction has been given as a causative factor; they, therefore, do not belong to the form of obstruction now under consideration.

I have found but two more cases recorded which illustrate the dynamic variety of ileus following operation—the cases of my friend, Dr. X. O. Werder. They are well known to you, as they were made a part of the exceedingly interesting paper which Dr. J. W. Long¹ presented to this Association at the Richmond meeting last year.

I wish to submit to your consideration today a brief report of a case of dynamic ileus which I saw early last fall.

Mrs. M., aged thirty-six years, mother of two children, very nervous and emaciated. Large unilocular intraligamentous cyst of right ovary, adherent to bowel and omentum.

Ovariectomy, September 29, 1896. Patient was very weak after the operation, but reacted well after the use of stimulants. Nausea and vomiting during the first twenty-four hours. Slight elevation of temperature; pulse-rate remained above normal. On the second day she was given and retained small doses of hot water and broth. Gas was expelled by the rectum. Her general condition improved, and at the end of the second day, with normal pulse and temperature, she seemed to be quite comfortable, and the case looked very favorable. On the following night, or early next morning, she again commenced to vomit, and for the first time complained of colicky pain in her abdomen, which was slightly distended. Increased peristalsis was audible; gurgling sounds could be heard at the bedside. Her condition grew gradually worse toward the end of the third day. The temperature varied between 99° and 101°, the pulse-rate between 100 and 120. All attempts to obtain a movement of the bowels by cathartics and intestinal injections resulted in failure. The distention of the abdomen increased. The patient became very nervous and restless, and the symptoms of collapse began to manifest themselves. Fecal vomiting occurred about seventy-six hours

¹ TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS, vol. ix. p. 214.

after operation. Half an hour later I found her profoundly collapsed, with a pulse of 150, hardly perceptible, no peristaltic action of the bowels ascertainable. The diagnosis of intestinal obstruction dependent upon some mechanical cause seemed to be certain.

The patient having been etherized, I reopened the incision. The small intestines were very much distended, their peritoneal covering slightly injected, smooth, and glistening. Six inches above the ileo-cecal valve and for a distance of about ten inches the ileum was firmly contracted, its lumen completely obliterated. The contracted portion was strongly wrinkled, as if a purse-string suture had been applied and tightly drawn. At its proximal end there was a slight abrasion. Immediately above the contracted portion the bowel was enormously distended and sacculated, showing the effect of the violent peristaltic action. The bowel below it was soft, empty, and collapsed. No adhesions, no fluid in the abdominal cavity, no evidence of peritonitis.

An attempt to force gas into the contracted portion by compressing the bowel above it was not successful. I opened the ileum, and a large amount of gas came away. Having stitched the bowel, I again turned my attention to the contracted portion, which was found to be unchanged. By this time the patient was almost pulseless, and I had to close the abdomen quickly. She recovered from the anesthetic and appeared to be improving for several hours, when early in the morning, coma supervened. She died in the middle of the fourth day after the first operation. No autopsy.

I regret to say that I have nothing to offer which could satisfactorily explain dynamic ileus. When I saw the firmly contracted portion of the ileum it at once reminded me of the experiment conducted by Dr. Robert T. Morris¹ at the Toronto meeting of this Association, while demonstrating the mechanism of ileo-intussusception in a rabbit. A sudden spasm of the circular muscle of the bowel was produced by touching the ileum with a bit of carbonate of sodium. The calibre of the bowel was decidedly reduced, and intussusception occurred.

From the evidence which this experiment and the cases under discussion present it seems to be at least not improbable that certain toxic substances, the result of decomposition of the intestinal con-

¹ *Ibid.*, vol. vii. p. 198.

tents play the most important part in the etiology of dynamic ileus. I look upon them as the exciting causes, which, under certain circumstances, may produce tonic contractions, a tetanic condition of a segment of the intestine, which not only continues under anesthesia, but, at least, for hours, even after death. This contraction, as the reports show, is found in those parts of the bowel which are nearest to the field of operation and exposed to manipulations and injuries. Here a point of least resistance is created in the intestinal tube by the irritations of the nerves supplying this part, by the disturbance of their mechanism, and by the changes which take place in the gut-wall.

I do not attempt an explanation of the very extensive tonic contractions found in Dr. Werder's first case. As in the other cases, the lower portion of the ileum was involved, but besides this the whole large intestine was in a state of firm contraction—a condition which I think it is impossible to satisfactorily explain at the present time. Further investigations into the pathology of dynamic ileus are needed to solve this and allied questions.

I beg to direct attention to the fact that in none of the four cases on record has a correct diagnosis been made. In my own case I arrived at the opinion that it was a mechanical obstruction I had to deal with. The symptomatology of this case is indicative of the presence of an obstruction, probably in the lower portion of the small intestine, but nothing more. Whether this obstruction was due to a tonic contraction or to a flexure, or constriction, or to any other form of mechanical obstruction, could not be determined.

As stated in the report, the patient was doing well at the end of the second day and during the following night until in the morning, when she complained of pain in the abdomen, was nauseated, and began to vomit. When I saw her in the forenoon the abdomen was slightly tympanitic, peristalsis increased, pulse accelerated. The pain complained of was not limited to a certain point, but extended over the whole abdomen, and was thought to be dependent upon the active peristaltic movements of the intestines. These conditions are so familiar to us, we meet with them so often in favorable cases at this period after operation, that we do not regard them as unusual. We know them to improve quickly after a movement of the bowels is obtained.

I saw the patient again in the afternoon. Her condition had

grown worse. The inability to get the bowels to act, the increased peristalsis, and the manifestations of threatening collapse suggested the probability of intestinal obstruction. The advisability of re-opening the abdomen was carefully considered, but the diagnosis was by no means clear at this time to justify interference.

It is probably more interesting to the surgeon than important to the welfare of the patient to attempt to differentiate in cases of post-operative intestinal obstruction between the various forms of ileus. Dynamic and mechanical ileus, to which it clinically belongs, as well as the adynamic variety, which I have described in my introductory remarks, and the ileus of sepsis, all lead to the same end—death—unless relieved by timely surgical interference. For practical purposes such differential diagnosis is hardly needed. We must distinguish, however, between these forms of ileus and the very obstinate constipation, often so difficult to overcome, after operations. This differential diagnosis is extremely difficult early in the course of the disease, in those instances where the symptoms are less distinct. Even fecal vomiting does not remove the doubt, for it sometimes occurs in favorable cases—*i. e.*, in cases which get well without surgical interference. It was not present in Olshausen's cases of adynamic ileus, and occurred late in my case of dynamic ileus.

There can be no doubt that these cases of obstinate constipation represent a mild form of that type of adynamic ileus described by Olshausen. In some instances, however, we must regard them as the result of an infection, of a slight localized peritonitis, which quickly subsided. As in cases of septic ileus, peristalsis is absent or greatly diminished, even hardly perceptible. This most important symptom, which distinguishes obstinate constipation and the various forms of adynamic ileus from dynamic and mechanical ileus, is apparently often overlooked or its value underrated.

During the progress of the disease the abdominal symptoms become more pronounced, the pulse more accelerated. The patient grows nervous and restless; she seems to realize that her life is in danger. Clearly, this condition can no longer be confounded with that of obstinate constipation. The only question to decide at this advanced stage is the differential diagnosis between septic peritonitis and ileus. The general condition of the patient during the first few days, the absence or slight elevation of temperature, and

the character and rate of the pulse at this time, permit us to exclude sepsis as the probable lesion. The continued increased peristaltic action confirms this view, and makes it clear that an occlusion of the bowel exists.

We have been, and still are, under the influence of that doctrine which sees in every case of intestinal obstruction, subsequent to operation, in the first place a case of septic peritonitis, whether there be a rise of temperature or not. It is the influence of this doctrine which has stilled the hands of many a surgeon until the patient was beyond the reach of human aid. So deeply rooted is this doctrine that even in those cases which die on the fourth day or later, and in which at the autopsy no visible evidence of peritonitis can be found, sepsis is diagnosed, or at least suspected, and the operator criticises himself and his assistants for having infected the patient. It is well known that a patient may die of acute fulminating peritonitis in from twenty to thirty-six hours after operation without any symptoms of peritonitis in the abdominal cavity. But why these symptoms should not develop after sufficient time for their development has elapsed before death ensues is certainly difficult to comprehend. The true cause of death in those cases which terminate fatally at or after the fourth day is by no means clear. Is it not fair to assume that these patients do not die from peritonitis alone, if it be admissible to thus term this condition, but that death must be attributed far more to the toxic substances which result from decomposition of the intestinal contents?

Whenever a doubt remains as to the true nature of the disease, the patient should have the benefit of the doubt. The abdomen should be re-opened, or, in cases following vaginal hysterectomy, an exploratory incision should be made. The gravity of the condition and the slight danger attending these methods of investigation render them justifiable.

The importance of an early diagnosis should never be lost sight of. Collapse may set in unexpectedly, making surgical interference hopeless. The early profound collapse in my case must be attributed to the very poor health of the patient, whose vitality was far below par when I first saw her. With the appearance of collapse peristalsis ceased, the intestines being over-distended and paralyzed. There are no points of distinction between the various

forms of ileus—including the paresis of general peritonitis—at this stage of the disease.

I have omitted to differentiate between dynamic ileus and the various types of mechanical ileus. Dynamic ileus belongs clinically to the mechanical variety, from which it cannot be distinguished if the obstruction occurs in the same portion of the intestine. A discussion of the accessory symptoms which are observable in cases of mechanical ileus, and which differ according to the location and character of the obstruction, is deemed to be beyond the scope of this article.

Dynamic ileus following operations must be regarded as a surgical disease, and surgical treatment, in order to be successful, must be instituted before the vital forces of the patient are exhausted. This statement may at first sight seem to be too radical. The lessons, however, which the cases on record teach us, in my opinion, warrant this assertion, notwithstanding the fact that all the patients died, two with and two without operative interference.

The ordinary means—cathartics, enemata, and stomach-washing—have been faithfully tried and have utterly failed to give relief. The nature of the obstruction has led to the suggestion of antispasmodics. I do not think they can influence a contraction which persists under anesthesia, nor do I understand how we are to find the indication for their use, as post-operative dynamic ileus cannot be diagnosticated.

It is of the greatest importance not to lose time with a method of treatment which, though giving temporary relief, is not curative. I refer to stomach-washing, and I fully agree with those who see in such temporary improvement a danger to the patient, as it is apt to deceive the surgeon. From my own experience, I must warn against lavage in the later course of the disease, as it decidedly hastens collapse.

The two patients treated surgically died ; they were operated on too late. As we know nothing about the condition of the contracted portion of the bowel after operation, it is questionable whether a simple incision of the intestine will save the patient. As an emergency operation, a portion of the distended bowel should be sutured to the abdominal wound, incised and the intestinal contents removed. If necessary, a secondary operation may be done later.

DISCUSSION ON THE PAPERS OF DRS. WERDER
AND BLÜME.

DR. E. W. CUSHING, of Boston.—Mr. President: These papers have opened up a subject of the greatest interest, and it is as important as any topic which has come before the Association at this meeting, for the reason that it is so comparatively new, so obscure, and it forms really the principal danger to which our patients are now subjected. In our operative work, even after getting rid of sepsis, there still remains this difficulty of the bowel. I recognize the clinical picture in these cases. We know the exact conditions, as the last writer has stated. Some of the cases are septic. It is only within the last few years that I have learned to differentiate obstruction from sepsis, as the writer suggests, and prompt operation has saved a number of cases. I have seen this tonic contraction of the intestines during operation and did not know how to account for it. I think it is a condition akin to, only more aggravated than, ordinary colic. Where there is a tonic contraction of the intestines the patients have suffered from colic.

In regard to the use of injections, I think they are given in a way to do very little good. To simply direct a nurse to give turpentine, etc., in these cases does no good. The method which I have found the most effectual is to put the patient in the obstetric position, but on the right side, with the hips elevated high, so that there shall be as much chance for the abdomen to sag forward, and the fluid to run down hill, as possible. The fluid is allowed to run into the bowel in a continuous stream, and in a little while the rectum will expel some of it. Presently the first portion of the rectum is distended, and the fluid is running out and in. Soon the rectum yields a little more, and then becomes tolerant and distended; you get to the colon, and that is filled with water, and by washing it thus for a while the water will work its way even past the ileo-cecal valve. If lucky, you will notice a fecal odor or matter. If you can once get that you will save the patient. Several patients have been saved by the persistent use of water in this way. Two or three bucketfuls of water may be needed before the desired effect is reached. The water should have soap in it. You do not want to irritate the bowel, but simply to distend it, and gradually the spasm yields.

DR. M. ROSENWASSER, of Cleveland.—As Dr. Cushing has said, these two papers are of great interest and importance; they have given us

additional light as to the manner of procedure in cases of apparent intestinal obstruction from sepsis or otherwise; the more cases the more light. I desire to place on record a case bearing on this subject, which I had last spring. It was one that I had operated on for double pus-tubes in which there were universal adhesions. In breaking up the adhesions I had to do considerable violence to the pelvic floor. The patient did well for the first twenty-four hours. During the second twenty-four hours she manifested symptoms of partial obstruction. She had vomiting, yet slight passage of gas. She also had colicky pains. I had her bed elevated, and copious injections administered, which produced no satisfactory improvement. On the third day there were again occasional evacuations of gas. The size of the abdomen did not increase, so that I felt sure she did not have complete intestinal obstruction, but that it was only partial; for this reason I continued to hope that the patient would get better and would not require a second operation. At the end of five days she died. To relieve the sharp colicky pains I was obliged to use morphine, which, as a rule, I do not use after abdominal operations. The absence of distention of the abdomen coincides with the report of Dr. Werder. It was not at all like the distention we observe in ordinary septic cases. I cannot say whether my patient had previously been neurotic or not.

A thorough autopsy was made, including a bacteriological examination. There was a slight amount of fluid in the peritoneum; a little lymph, but certainly no gross evidence of bowel infection; yet the bacteriological examination showed streptococci in three separate cultures. In addition to this we found that the large intestine was distended to the descending colon, which was constricted as far as the rectum to the size of a contracted ileum. The tetanic contraction of the bowel in this case was probably due to septic infection.

DR. WERDER (closing the discussion on his part).—I am very glad to have heard an expression of opinion from other Fellows of the Association who have had a similar experience. Since reading my paper two or three gentlemen have reported cases to me that have come under their observation. I am sorry that the discussion was not more general, for I had hoped to get a little more light on the subject, especially in regard to the relation of the spasmodic and the tonic contractions. The point I wished to emphasize in my paper was that the two conditions were identical, and that they differed only in the severity of the contractions; in other words, the spasmodic contractions found accidentally in the two cases reported were of the same nature as the tonic contractions found in connection with the ileus. That the cases of ileus reported were not due to post-mortem changes, I think was made

plain enough in my paper, but I will state again that in both cases there was a sacculated condition of the intestine above the point of constriction, showing that there had been quite a marked effort on the part of nature to expel flatus.

There is one point that I would like to bring out in the differential diagnosis between the paralytic ileus of septic peritonitis, the so-called adynamic ileus, and the cases of dynamic ileus or tonic enterospasm observed by me, and that is this: In neither of my cases was there any distention of the abdomen—in fact, the abdomen remained flat. Another marked contrast between septic ileus and this form consisted in the marked peristaltic movements persisting for several days; they were so marked that they could be seen through the abdominal walls. The pains were unusually severe, like cramps, showing, in my opinion, conclusively that the intestine was trying to overcome some obstruction.

DR. BLUME (closing the discussion).—It was my intention to bring out in my paper the differential diagnosis between adynamic ileus, on the one hand, and dynamic and mechanical ileus, on the other hand, and I wished to call attention to that form of adynamic ileus which either is not dependent upon sepsis, or is the result of a mild localized peritonitis, conditions not necessarily fatal. The most important symptom which distinguishes adynamic ileus from dynamic and mechanical ileus is the absence of peristalsis. Peristalsis is also absent or decidedly diminished in cases of obstinate constipation, in which we have so much difficulty in moving the bowels and which give us a great deal of trouble.

When a patient who has been doing well the first few days after operation presents the symptoms of intestinal obstruction, sepsis can fairly be excluded. After the usual methods to produce a movement of the bowels have failed, surgical interference is not only justifiable, but is the only means to save the patient. An early operation is of the greatest importance. No time should be lost, for with the appearance of collapse the condition of the patient becomes practically hopeless. Our experience in interfering with this class of cases has, so far, not been very encouraging. Most patients died, not because they could not be relieved by surgical interference, but because interference came too late.