An Address

UPON

THE SURGICAL TREATMENT OF ACUTE INTESTINAL OBSTRUCTION.

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IN considering this subject it will be well in the interests of brevity to define at once as comprehensively as possible the factors in obstruction which we have to treat surgically. These may be conveniently arranged under three heads. Some are purely (1) mechanical or anatomical factors; some are (2) physical factors; and some, again, are (3) vital factors. It would be impossible in the short time allotted to us to deal with all these in all their bearings and only the most important of each can be noticed.

1. Under the head of "anatomical factors" will come the consideration of the part of the intestinal tract which is the seat of the stoppage. This has an important bearing upon the treatment in so far as it claims the greatest promptitude of action and the most delicate handling of the parts involved. It is well known that the higher up the obstruction the earlier and the more acute, speaking generally, are the symptoms. On the other hand, the lower down the stoppage the greater the amount of retained matter and the more septic is it, while marked symptoms set in as a rule later. It is also almost certain that operations involving structures high up in the abdomen make a heavier demand upon the patient's powers than those done on parts low down. The character of the obstruction may best be placed perhaps under the heading "mechanical," whether it be a band, a volvulus or an intussusception, or an inclusion of bowel in one or other of the several pouches of the peritoneum. All these variations in the form of mechanical cause of obstruction have an important bearing on the treatment and must be constantly borne in mind, though we cannot dwell upon them here. It is enough to say that they are relatively the least important of all the factors. They have to be removed and this is a matter of mechanics and comparatively easy.

2. Of far more importance are the factors which may be grouped under the head of "physical changes" in the bowel. These include the anæmia at the point actually constricted, the venous engorgement of the parts distal to the constriction which is common, the consequent œdema, thrombosis, and frequently sphacelus or ulceration of that portion which are inevitable if there is delay in the treatment.

3. But under the heading "vital changes" come the most important factors of all in stoppage of the bowels. It may be a simple matter to find out and to divide a band, to untwist a volvulus, or to unravel an intussusception or other mechanical obstruction and thus to relieve the venous engorgement and its attendant physical evils. But in many, if not in most, of the cases of obstruction as they reach the surgeon the trouble does not end here. We have still to contend against both local and general "vital changes" in the body and these, I venture to think, are nowadays our greatest difficulty, since the dangers of mere opening the peritoneum have receded into the background. Above an obstruction, say low down, we have much retained fæces. In these we have swarms of bacteria existing under the most favourable conditions for multiplication. The retained matters are being constantly driven against the blocked spot by peristalsis and as a consequence the bowel becomes more and more congested and hypersecretion takes place. The micro-organisms fabricate in time large quantities of toxins for which there is no escape. Consequently, they are absorbed into the system by the usual channels, producing profound general depression of vitality with fever and often lung and kidney complications, and besides this soaking the congested bowel wall for a long stretch above the constriction, further devitalising it, causing paresis or paralysis of its muscular tissue, and preparing the way for that migration of bacteria through the bowel wall into

the peritoneum which we now know takes place even without any breach of continuity if the vitality of the bowel has fallen below a certain level. As a consequence we have in advanced cases to deal with infection of the peritoneum even without perforation and, moreover, after an obstruction has been relieved such peritonitis may start from an unopened bowel soddened with toxins and loaded with putrid material which in its paralysed condition it is unable to get rid of by propulsion.

All these factors are met with in varying degrees in almost every case of intestinal obstruction with which surgeons come in contact from that caused by a band to that due to a volvulus. And if the surgeon is to treat the case rationally they must all be borne in mind and be met by special measures in each case. It will only be possible here to sketch in the merest outline the surgical methods to be employed in dealing with such conditions on the reasoning already given in brief.

Obviously in cases where an early diagnosis has been made and few or none of the *physical* or *vital* changes alluded to are present our only care is to restore as soon as possible the anatomical integrity of the intestinal tube. We have nothing to fear from the physical or vital changes in the gut, peritoneum, or system generally. This is quite clear from our experiences with recently strangulated herniæ. We divide the constriction, replace the bowel, and expect and obtain, as a rule, rapid recovery. The same is the case where a band is divided *early* in a case of *internal* strangulation or where an intussusception is unravelled or a volvulus untwisted. It is purely and only a question of mechanical relief. Clearly, then, it is unnecessary to labour the claim for an early diagnosis and prompt surgical action. More depends upon these than upon any particular method or details, however good they may be.

Unfortunately, however, delay both in diagnosis and surgical interference still too frequently takes place in cases of intestinal obstruction and when at last an operation is undertaken we are face to face with physical and vital conditions, local and general, which continue to be dangerous or even disastrous after the mechanical obstruction has been relieved. What can be expected of surgical interference where a bowel for a long distance above the obstructed point is in a state of paresis or complete paralysis and is loaded with pints of putrid, fermenting fluid and the walls of which have almost or entirely lost their vitality? Such a bowel after release of the obstruction may subsequently necrose and perforate, or, even without any breach of continuity, its loss of vitality may permit the passage through it of virulent organisms present in millions which do not pass through healthy walls. How little can surgery do when as a consequence of these changes the system is saturated with toxins depressing the functions of every organ and tissue in the body and probably already initiating well-known pulmonary and renal diseases. Surgical interference involving a long operation undertaken under these conditions is *necessarily* and *inevitably* imperfect in the highest degree and, as we know, is often futile. As if to emphasise this point, while writing the foregoing sentence a few evenings ago I was telephoned for to see a case of intestinal obstruction at hospital which had just arrived. I put down my pen and went at once, but only to see the patient expire just as I reached the bedside after getting rid of a large quantity of stercoraceous vomit. I have since heard that the post-mortem examination showed a band obstructing the ileum low down and that the latter for a long distance above was in a most unsound condition and could not have been left in the abdomen with any prospect of recovery.

But in turning now to the details of the operative treatment, let us suppose that a case though bad has not yet reached quite such a hopeless stage as that just mentioned and let us try to formulate rules of procedure. This can be modified according to the stage of obstruction at which the patient has arrived.

The first thing is to ascertain whether the stomach has been emptied. It may be stated by the friends that vomiting has just taken place, but this should not deter us from using the stomach-tube and we shall be surprised in many cases by the quantity of foul matter which can be removed even where vomiting has been free just before. To leave this matter in the stomach is to court disaster either during the operation, if a general anæsthetic is employed, or later. The lungs and the kidneys have to be considered as well as the intestine itself, which, already paralysed, is after operation in the worst possible condition for propelling its contents

downward. This washing out should be repeated over and over again before the patient is anæsthetised.

The mouth and throat should then be washed out with some antiseptic fluid, such as chlorate of potash or sanitas, and a warm drink of brandy-and-water should be given if the stomach is empty. If the patient is very feeble it is also sometimes of the greatest use to instil subcutaneously half a litre of a 5 per cent. solution of glucose or of normal saline. This has not only the effect of supplying the tissues with the water which has been lost by vomiting, and by the lungs, skin, and kidneys, but also gives the latter organs a better chance of eliminating toxins in diluted form and consequently with less damage to themselves. The glucose, too, is a food and in 5 per cent. solution is isotonic with the blood and easily borne by the tissues into which it is injected. If glucose and normal saline are used together the first should be 2½ per cent. and the salt 0·45 per cent., which I have found to be isotonic. Alone they are respectively 5 per cent. and 0·9 per cent. A rectal injection of warm normal saline solution and half an ounce of brandy is also desirable.

The further preparation for operation includes all the precautions of asepsis. The society has so recently had the advantage of hearing Mr. C. B. Lockwood upon this subject that nothing further need be said upon it now except that I should like to express the conviction, based upon an experience of asepsis pure and simple for many years, that the less *chemical germicides* are used once the skin has been cleansed the better for the result of the operation. They should never be used within the abdomen.

The patient should, of course, be kept as warm as possible by being wrapped in wool and surrounded with hot bottles, the room being heated to at least 70° F.

The choice of an anæsthetic is a matter for each surgeon to decide for himself. But for my own part I feel more and more every day that these operations should be done under local analgesia, wholly or in part. This feeling is not due to any special fear of ether or chloroform in ordinary cases. But in those under discussion, where the respiration is often embarrassed by a distended abdomen and where the vital powers are lowered by want of food, vomiting, and in many instances by advanced toxæmia, I have a very strong conviction that the chances of recovery are very much diminished by general anæsthesia. It is an easy thing now to render the skin, muscles, and neighbouring peritoneum absolutely insensitive to pain, and as the intestines themselves are insensitive they can be cut, stitched, and handled without any suffering. The root of the mesentery and its lateral reflection are the crux and if it is necessary a little chloroform can be given for the necessary intra-abdominal manipulation which may only last a few minutes. But it is a very different thing to give a general anæsthetic for, say, five minutes and to keep a patient even lightly under for from 50 to 100 minutes. In one case there are usually no depression and no after-sickness; in the other there are usually both. For children and for certain nervous young people local analgesia is unsuitable, but this class of patients, as a rule, bear chloroform well. It is for the mature, and particularly the aged, that I would plead for a more extended use of local analgesia. In its most recent development it is an enormous improvement on the form it took up to a year ago. But the details must be mastered by much practice in a variety of cases before it can be employed with confidence.

When the abdomen is opened it is a most valuable rule to search first of all for a loop of *empty* bowel in the right iliac fossa as a guide to the obstruction which in the majority of cases is low down. This is a far easier method of finding the point of stoppage than to search along the distended gut which is proverbially difficult to manipulate and to control.

The actual release of the obstructed bowel is a purely mechanical matter and will be carried out by different surgeons in various ways but it is certainly easier to work from the empty bowel towards the distended portion than *vice versa*. If a band is found it is a simple thing to divide it. If an intussusception is present we only follow the path of wisdom if we adopt Mr. Jonathan Hutchinson's advice of long ago and always attack it from the distal end and avoid all pulling from the proximal. Only one other point I would venture to plead for in this connexion—namely, that all this should be done as far as possible within the abdomen. I am no friend of eventration and believe it to be in most cases not only hurtful but unnecessary. One is tempted, of

course, to do it in cases of great distension. But even here it is better to draw forward a small portion of the most distended gut and to slit it open over a basin and to empty it than to expose large tracts externally. It must not be forgotten that the mere evacuation of gas and liquid fæces revives the patient and where great asthenia is present, of course, in some cases the operation should go no further until the abdomen is emptied, but such cases are in my experience few nowadays.

But short of these almost hopeless cases others give us nearly as much anxiety where several feet of bowel above the obstruction are distended, paralysed, sodden, and discoloured. From experience we know that this bowel is most probably ulcerated internally not only at and just above the constriction but often for a foot or two upwards. What are we to do in such a case? To return the bowel after simply relieving the obstruction is to allow pints of fermenting fæces either to remain stagnant or to escape into the empty, and as it were hungry, bowel below with all the risks of more abundant absorption of the poison than before. If this is not done one of two alternatives remains. Either we must temporarily drain the distended gut or boldly resect several feet of it with their contents and unite the upper and lower portions. Of the two I prefer the latter course. By this means we remove at one sweep all the septic bowel and its contents and with these the greatest dangers to the patient. These are the dangers of peritoneal infection with or without sloughing or perforation of the bowel and of toxæmia from absorption of its liberated contents as they pass into the intestine below. For the last five years I have generally acted on this principle with results far superior to any I was able to obtain previously. But I have so recently written upon this subject in detail with an analysis of all the cases which led to this rather bold conclusion that it is natural to hesitate to take up your time by going over the ground again.¹

One point is perfectly clear from the experience of these recent cases—namely, that there is no more shock from removing several feet of bowel than there is from taking away a few inches. Again, we need to be reminded that the anastomosis of the remaining parts is equally easy or difficult independently of the length of the part resected.

Permit me to allude to two cases of acute intestinal obstruction in which this course was adopted with perfect success. The gut removed in each case is on the table. The first was that of a feeble old woman, aged 78 years, with an intermitting pulse when admitted. The cause of the obstruction was a band and the gut for quite two feet was black and almost gangrenous and was surrounded by more than a pint of dirty stinking fluid which gushed out when the abdomen was opened. Here I excised five and a half feet and joined end to end. There was *no* shock and recovery was perfect under one dressing. The patient returned to show herself quite well a year later and is, I believe, still well four years after operation. (N.B.—The bowel was extensively ulcerated above the obstruction.) The next case was that of a woman, aged 52 years, with a gangrenous femoral hernia. I had to go more than six feet above the obstruction to find fairly healthy bowel. Lateral anastomosis was done and six and a half feet of ileum were cut away between the point of junction and the obstruction. Here, too, there was no shock and the recovery was complete. But it is interesting to note that there was much very foul diarrhœa for some days. On the third day after operation the patient had three copious putrid stools, on the fourth day she had five, and on the fifth day six, and then there was no action of the bowels until the ninth day, but still a loose motion, though not so foul. Here the evacuations must have come from above the point of junction, for the bowels were well opened on the fourth day of strangulation after stercoraceous vomiting had set in. Neither of these cases could have recovered if it had been possible to replace the bowel loaded with putrid fæces. They would have died either from perforation or toxæmia, or from the exhaustion of diarrhœa in getting rid of the festering material stored up above. Let it be remembered that if the bowel be distended to only two inches in diameter every foot of it will contain more than one pint of putrid material.

On the question of shock from these operations I should like to be permitted to mention briefly one other case of recent occurrence. This was the case of a patient under the care of Dr. F. Roberts and was one of the

¹ THE LANCET, May 30th (p. 1495) and June 6th (p. 1576), 1903.

worst cases of typhoid fever he or my other colleagues had ever seen. The woman, who was 33 years of age, was in the third week of the disease. She had suffered from severe hæmorrhages, had had severe bronchitis, and on the day of operation had a temperature of 105·6° F. with rigors. Symptoms of perforation having come on I was asked to operate. Dr. F. J. Poynton, who was kind enough to see the patient with me in the unavoidable absence of Dr. Roberts, gave it as his opinion that she would die if a general anæsthetic was employed but that if an operation could be done under local anæsthesia without shock it ought to be done at once. I opened the abdomen under *B* eucaïne analgesia and found extensive gangrenous patches over a length of intestine and peritoneal effusion. As all were covered with lymph and threatening to give way I resected the whole loop, including 27 inches, and joined end to end (specimen shown). Again, according to the physicians in charge, there was no shock and the next day the patient was decidedly better with improvement of pulse and temperature. Fresh hæmorrhage set in later and she died as the result. There was ulceration in the remaining gut and throughout the whole colon down to the rectum, and apparently several of these ulcers had furnished the fatal hæmorrhage. The line of suture was perfect in every respect. The pulse had improved until the bleeding set in. I only mention these cases from among a number to illustrate the fact that there is not necessarily any shock from enterectomy.

The conclusions I should venture to draw from the foregoing reasoning are these: 1. That too much stress has been hitherto laid upon the mere removal of the mechanical stoppage and not enough upon the evacuation of the putrid material which is killing the patient. This is only to repeat the dictum of an old member of the society, Mr. Greig Smith. 2. That the older method of emptying the bowel by establishing an artificial anus is unsatisfactory as the bowel is in a state of paresis or complete paralysis and only expels its contents very slowly and until it is cleaned out the cause of the paralysis remains in great part, and you will remember Mr. Greig Smith's description of sitting up all night watching the gradual emptying of the bowel. Our experience teaches us this, and that this method of treatment is unsatisfactory any careful analysis of a long series of cases reveals, as I have endeavoured to show in the paper just referred to. 3. That the best course in many of these cases, probably in all that are still within the reach of any operative procedure, is to resect the tract of paralysed and distended bowel at once. This would not, of course, apply to recent cases where the bowel is not seriously damaged by the retained fæces and is manifestly sound at and above the seat of obstruction. But excluding these there remains unfortunately a large group of cases where we are face to face with a disastrous state of things which requires very bold action on our part.

On the question of drainage of the abdomen or not in these cases each surgeon will act upon his own judgment in particular cases. For my own part, I am in most cases in favour of closing the abdomen at once unless there be general peritonitis, having a great belief in the power of the peritoneum to take care of itself. The reasons for this would lead us too far. But I must admit that I have lost a case almost certainly from closing without drainage after resection of the diseased part.

The after-treatment of these cases is of extreme importance. They should in all instances sit up in bed from the first as much as possible and only lie down, preferably on one side or the other, for sleep, so as to overcome the tendency to hypostatic pneumonia.² They should begin at once to take a mixture of ten grains of carbonate of bismuth three times daily which, with Kocher, I believe to be the best intestinal antiseptic. Albumin water, with one drachm of brandy, should be given from the first by the mouth in small quantities and nutrient enemata and instillation under the skin of normal saline solution or 5 per cent. solution of glucose is recommended as a routine. Half a litre morning and evening may be given if necessary. Hitherto, perhaps, we have been too sparing of food by the mouth. In small quantities and light it may be given early, at all events in cases where the diseased bowel has been resected.

In many cases diarrhœa is a very troublesome complication. It is the natural effort to discharge a quantity of

putrid retained fæces and is often mixed with blood and mucus. It is not well to check it too much as this material must be evacuated before the patient is safe. Here the bismuth plays a useful part in cleansing the gut, and so arresting the diarrhœa.

In some cases, especially intussusceptions, the temperature rises to a high degree after liberation of the gut. The explanation usually given of this is the passage into the circulation of blood which has been stagnant in the included bowel long enough to be saturated with toxins. This is probably correct. Cold sponging and warm drinks have proved the best treatment for this condition so far as I have seen in many cases. If the fever is due to pulmonary emboli or pyelphlebitis we can only sustain the general strength by the use of the usual stimulants.

It must be obvious that in a subject such as this many other points might be discussed but time fails and only an outline can be given as a basis for debate.

SOME REMARKS ON PYOSALPINX BASED UPON NOTES OF 23 CASES.

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A COLLECTION of cases of one kind is always interesting to those engaged in similar work, and still more so if it covers a number of years and so reflects to some extent the evolution of the operator's views and of the measures employed. Although the number of cases is not large, inasmuch as cases occurring in connexion with fibroid tumours and some other complications are not included, it will be seen that the list extends in date from 1894 to 1903, a period of ten years. During the last decade a great amount of activity has been devoted to pelvic surgery and the changes have been many and radical. Thus in 1894 abdominal drainage by Keith's glass tubes was the rule after any operation upon structures in the pelvis, especially if any formation of pus was present. The powers of the peritoneum with regard to the disposal of effete material were but imperfectly known and still less trusted, and the differing virulence of pus was not so clearly appreciated as it is now. Since these two facts have received the due recognition of their force the old idea that drainage was in all cases imperatively necessary has ceased to be dominant and the dangers of the employment of drainage-tubes themselves have been more clearly recognised. In Case 8 there can be but little doubt that the tube contributed to the production of a fæcal fistula by its pressure upon the bowel. The same thing was threatened in Case 5. Glass tubes required frequent movement or they became impacted by the entrance of omentum or other structures into their openings below the surface. They were rotated and slightly lifted from time to time. During such movements it was very easy for a small knuckle of intestine to slip beneath their lower extremity and to become nipped between this and the concavity of the sacrum behind. Moreover, the opening into the peritoneal cavity intended as a means of exit for matters within was of necessity also a means of entrance for bacteria from without, and pus which had become sterile might easily become a nidus for the development of new and virulent organisms which thus were freshly implanted. The fact that the long retention of pus in a closed cavity, such as the Fallopian tube became, resulted in the death of the germs which had originally produced it, and that what was left was nothing more than a collection of fattily degenerated cells was for a long time but imperfectly understood and appreciated. When it was understood the apparent necessity for drainage of any undetected and unremoved particles of such a fluid disappeared. Then Clark, Muscatello, and others demonstrated the wonderful powers of absorption of the peritoneum which, when unhampered by the presence of drainage-tubes, quickly cleared away all dangerous material from its interior, and the necessity, if this were to be complete, of the re-formation of a perfectly closed cavity, in order that the necessary intra-peritoneal currents might once more come into play.

The presence of this glass tube was harmful in two other ways. The more important was the fact that a weak point

² The cases from which I excised 5½ feet and 6½ feet sat up at once and the old woman, 78 years of age, was in an armchair by the fireside on the sixth day.