

PERITONITIS FOLLOWING ABDOMINAL SURGERY*

JOHN B. DEEVER, M.D.

PHILADELPHIA, PA.

POSTOPERATIVE peritonitis is a contingency that should not be allowed to occur, but like many things that ought not to be, it will occasionally happen. It is only natural that we ask ourselves, Why? Following abdominal surgery peritonitis may result from infection present before the operation or it may be due to the operation itself; in other words, either an external or an internal factor or both factors may be responsible for this undesirable postoperative event.

Let us first consider the external factors. These may be summed up in the words aseptic technic or rather the lack of it. As we all know, the instruments and the hands of the operating staff may be the source of bacteria and the agency of their dissemination. These factors are avoidable by careful technic. It goes without saying that all instruments, gauze, ligatures, etc., should be aseptically prepared and should be kept sterile. In the Lankenau Clinic we have a detective in the person of the bacteriologist who at any time and as often as he wishes takes smears and cultures of the hands of the operating personnel from the surgeon down. In fact there is a pleasant rivalry among us as to the best record for this personal asepsis.

The second external factor is the skin of the abdomen of the patient. Staphylococcus we know is always present in the skin and is not an infrequent finding in postoperative peritonitis. Therefore an essential part of operative asepsis is careful preparation of the patient. These are mechanical factors. They are controllable and should never be the cause of postoperative peritonitis. But not all external factors are mechanical and controllable; for example, penetrating wounds of the abdomen. While proper technic, as a rule, provides against this type of infection, it cannot always be controlled since much depends upon

the conditions prevalent at the time of the injury. But naturally every effort must be made to get as aseptic an operative field as circumstances permit.

Now as to the intra-abdominal factors, or infection present at the operation. This comprises the main point of our discussion. As a rule the infection resides in the operative field and its vicinity. It may however reside in a distant focus. The defensive mechanism of the body may be so weakened by disease that organisms from a distant focus may be released by the operative act and find a fertile soil in the peritoneum. The lesson carried by this possibility is preoperative attention to oral hygiene, the respiratory tract, etc., in fact all precautions that make for safe surgery. The local intra-abdominal sources for possible dissemination are numerous and varied. I need but mention two of the more common ones: encysted collections of pus from an inflamed appendix or from a pelvic abscess. The prevention of peritonitis in these cases is both a matter of diagnosis and of operative technic. Preoperative determination of the presence of an abscessed appendix should lead the surgeon to take the first step in preventing contamination by making the proper approach, an extraperitoneal approach when this is possible. In fact in all recognized infected cases the incision should be so planned as to enable the surgeon to deal with the infected focus without invading healthy tissue. This means also the proper placing of gauze pads, using sheets of rubber dam, providing proper drainage, etc. There are, of course, no rules for these procedures. Their use is a part of surgical judgment and their efficiency is established by the high or low incidence of postoperative peritonitis in the records of each individual surgeon.

An encysted collection of pus in the

* Submitted for publication, April 8, 1930.

majority of cases of appendicitis fortunately is in the lower right abdomen, and can be evacuated by an extraperitoneal approach; where the collection is high up, lateral and posterior to the base of the cecum and colon, the extraperitoneal incision, carried well out and dividing the muscles in the line of the skin is also less likely to be followed by postoperative peritonitis than when the incision is made over the most prominent part of, or mesial to the swelling. After the abscess cavity has been evacuated and no rivulets of pus are seen emptying into the cavity, and the appendix is neither visible nor palpable, nothing more than drainage of the cavity should be done. It is our practice to pack the cavity lightly with loose gauze wrung out of a 1:20 carbolic acid solution. When the appendix can be seen and felt and can be removed in its entirety without danger of breaking through the limiting wall that separates it from the preperitoneal cavity, it is removed and the cavity packed with loose gauze. When the limiting wall is broken through and especially if there is a small amount of pus at the base of the appendix, the cavity is packed at once, and after separating the parietal from the visceral layer of peritoneum around the inner circumference of the cavity, we lift up the abdominal walls and the underlying parietal peritoneum, introduce a large sheet of rubber dam and follow this by the introduction of one or more large abdominal pads and smaller pads, if necessary, to wall off and thoroughly protect the surrounding peritoneum. The appendix is then removed and the cavity packed. This is frequently done in our clinic with good results, which means no postoperative peritonitis, and as a rule recovery. Where the walls of the encysted collection are made up entirely of coils of small intestine, the risk of subsequent peritonitis is greater. If we are able to recognize the condition we hesitate to do an early operation.

In case of a pelvic encysted collection, if it is low down the incision is made, in the

male through the rectum, and in the female through the roof of the vagina, posterior to the cervix. If the pelvic collection is located in the median line the incision is made above the pubis after the bladder has been emptied by catheter. In a pelvic abscess resulting from disease of the uterine appendages, the approach is best made through the vagina. But if there is any uncertainty about the state of affairs, that is, if there is danger of puncturing a coil of bowel, we open the abdomen in order to ascertain the topography and then make the approach through the vagina and close the abdominal wound.

A potential cause of postoperative peritonitis is found in operations on the intestinal tract in which the gut, with its rich bacterial content, has to be incised. Here also the careful planning of the operation and meticulous care to avoid contamination by spilling the intestinal contents will prevent the undesirable postoperative complication we are discussing. In operating an intestinal obstruction when one is not absolutely sure that the obstruction has been relieved there should be no hesitancy in turning out the entire small intestine so that it and the large intestine can be thoroughly examined. No harm need accrue from the procedure provided the operative field is sterile and the intestines are well covered with large warm gauze pads.

The foregoing are some of the more common causes of peritonitis after abdominal surgery. They can be recognized before or at the operation and with judgment and technic can, to a large extent, be so handled as to provide for an aseptic recovery. There are, however, a few potentialities which cannot be foreseen. Fortunately, they are rare. Among these may be mentioned an infected blood clot as in a ruptured extra-uterine pregnancy. In these cases it is always our practice to cleanse the peritoneal cavity of blood clots. Failing to do this runs the risk of the clot or clots becoming infected by migration of microorganisms through the walls of

the intestine. This applies likewise to intraperitoneal hemorrhage from any cause. Other cases may be attributable to overlooked intestinal obstruction due to incomplete primary operation for obstruction. For example, snaring of a knuckle of bowel into a rent in the mesentery, or into a congenital hole, or a loop of bowel that has become engaged between the margins of the opening in the transverse mesocolon through which the stomach is drawn in making a posterior gastroenterostomy and where the lesser peritoneal cavity has not been completely closed, when stitching the margins of the opening in the transverse mesocolon to the wall of the stomach immediately above the anastomosis.

Bile leakage after gall tract surgery causing a bile peritonitis also occasionally occurs and sometimes can be traced to unrecognized anomalies of the bile ducts; or to slipping of the ligature in the cystic duct, or to incomplete closure of the gall bladder bed after cholecystectomy. These are favorable cases for re-operation if not allowed to linger too long.

With these briefly stated facts in mind, it is easy to recognize that abdominal surgery has its pitfalls, which in most instances, however, can be avoided. It is a trite saying that the best way to treat postoperative peritonitis is to prevent it.

As already indicated the most important step in the technic of abdominal surgery where infection is present is to avoid contaminating the peritoneum around the infected area. This is the surgeon's greatest concern. What is the best way to guard against spreading infection? First, its recognition by inspection, color and odor; secondly, by taking smears of the area around and distal to the operative field, having them examined and immediately reported upon. This takes but a few

minutes, provided the proper equipment is at hand, which includes above all a competent bacteriologist working in a room adjoining the operating theater. This is one of the operating surgeon's greatest assets. I realize that this equipment is not always at hand, but that fact does not alter the desirability of having it. The report of smears of the area distal to the site of infection is a guide as to how far to carry protection, as well as to the amount and kind of drainage to use and where it is to be placed so as best to serve its purpose.

If in the absence of these precautions or in spite of them, peritonitis does set in, the treatment is the same as for the preoperative inflammation, that is, providing for localization by the usual measures of complete anatomic and physiologic rest and re-operating at the most opportune time. While some surgeons advocate immediate re-operation, this is not our practice, except where the operation has been done for a visceral injury. If, as sometimes happens, the patient on the first or second day appears not to be doing well, prompt re-operation is indicated. By not doing well, we mean, of course, presenting the usual signs and symptoms of peritonitis, rigidity, hyperperistalsis, tenderness, etc. With the patient under the careful constant observation of a well-trained interne, the time for operation can be better seized than in the preoperative case when peritonitis has, as a rule, already set in when the patient is brought to the hospital. While the postoperative case has this advantage, it labors under the great disadvantage of the effects of the first operation and it is only by superhuman efforts and good fortune that recovery takes place. Therefore the trite dictum cannot be too often repeated: The best way to treat postoperative peritonitis is to prevent it.

