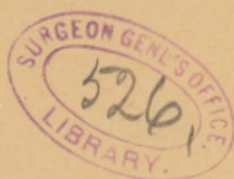


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THE VALUE OF PLASTIC WORK IN OPERATIONS
INVOLVING THE PERITONÆUM.*

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The three essentials in successful abdominal work are (1) *asepsis*; (2) *hæmostasis*; and (3) *plastic work*. We will consider only the last, noticing the first two merely as they are related to plastic work. I think, however, it can be clearly shown that plastic work contributes materially to both asepsis and hæmostasis.

In health the peritonæum offers a smooth external surface, so that the viscera may move easily and without friction upon each other. This is due (1) to the anatomy of the peritonæum, being covered as it is with endothelial cells; and (2) to the serous secretion, which is just sufficient to keep the membrane moist. This membrane has two functions which stand out pre-eminently, (1) the *absorption* of any fluids that may be poured into its cavity; (2) the formation of *plastic lymph*, producing adhesions. The first is, of course, an effort on the part of the peritonæum to carry away deleterious matter. The second is also an effort of Nature, and under certain conditions is a life-saving process. Take for example a case of perforative appendicitis. The appendix is inflamed, ulceration begins from the inner side of the appendix; long before the perforation has reached the cavity of the peritonæum, the peritonæum throws out plastic material forming limiting adhesions, restraining and circumscribing the infectious matter, which

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is poured out through the perforation. The same is true of salpingitis. As soon as the tube is infected, the peritoneal coat of the fimbriated end begins to swell and soon closes the extremity of the tube, thus sealing the tube and preventing the infectious matter from reaching the peritonæum by this channel.

So then this plastic exudation should not be considered pathological, even though we grant that it never occurs in a state of health, but only when some morbid process is present. The abdominal surgeon should ever bear this valuable and to me wonderful property of the peritonæum in mind.

But often this very conservative effort of Nature is perverted into a pathological condition, such for instance are the adhesions forming after abdominal section. These adhesions are hurtful in that they may produce (1) painful peristalsis; (2) constant pain; or even (3) ileus. So common is it for adhesions to form after an abdominal sec-

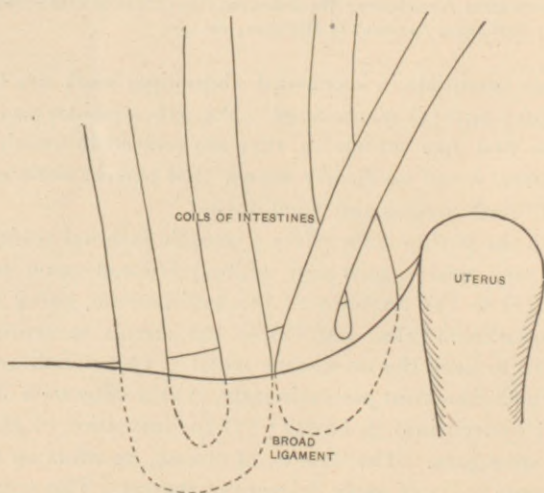


FIG. I.

tion, that the *American Text-Book of Gynecology* says, that they always occur.

The occurrence of adhesions was forcibly impressed on my mind in the case of a negro woman, from whom I removed an intraligamentous growth. After hulling out the tumor, the bed seemed clean and free from hæmorrhage and I did not regard it necessary to close the parts. Four days after the operation I was compelled to reopen

the abdomen, because of a leaking intestinal wound, when I found that coils of small intestine had fallen down into the cavity from which I had removed the tumor, and were densely adherent. Had I

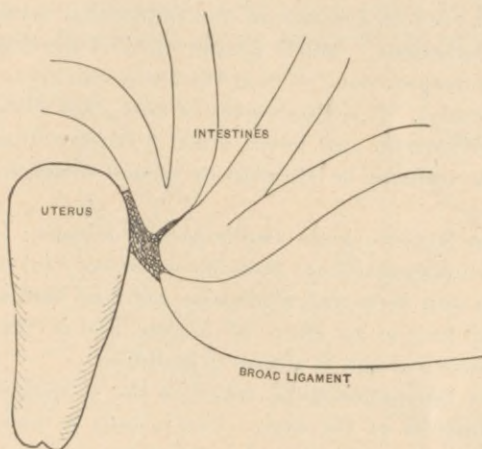


FIG. 2.

taken the precaution to bring the edges of the ligamentous wound together, the intestines could not have got into the place.

Adhesions sometimes form at a *very limited point* that is not covered by peritonæum. I recall an instance of this kind in a case where I assisted my colleague, Dr. Johnston, to do a secondary abdominal section on a young lady, whose tubes and ovaries had been removed by another surgeon, because of epilepsy occurring at the time of her periods. The first operation had been done by a skillful surgeon, but her periods and the epileptic seizures continued and the woman's mind was rapidly becoming a blank. Dr. Johnston opened the abdomen and found that the former operation had been a very clean and perfect one and the only pathological lesion to be found was the adhesion of two coils of intestines to the stump of the right tube.

These he carefully freed, covered the abraded surfaces of the intestine, touched the stump of the tube with the Paquelin cautery, and closed the abdomen without drainage. This case made a rapid and perfect recovery; the periods ceasing, the seizures not returning, and her mind rapidly regaining its equilibrium. True this case is not an ordinary one; the adhesions produced a reflex of a very exaggerated nature, but it serves to illustrate the fact that a raw surface, ever

so small, inside the peritoneal cavity, may cause adhesions, which are very detrimental to health.

The ideal condition in which to leave the peritonæum after an abdominal section is an *unbroken endothelial surface*. For it is to be remembered that even an abrasion of the endothelial layer, invites the formation of adhesions. Much greater then is the danger of adhesions when the deeper coats, or even the entire thickness of the membrane, are destroyed. It is also worthy of note, that while two normal surfaces of peritonæum can never unite, it requires that only one of the contiguous surfaces be abraded or injured to set up an adhesive inflammation.

From these facts we learn two important lessons: (1) the readiness of the peritonæum to form *protective adhesions*; (2) the liability of the abraded or torn peritonæum to cause *adhesions that are harmful*.

The first of these is an effort of Nature, and is conservative, the second is pathological and is always deleterious.

To prevent the pathological effects of the second, we utilize the protective influences of the first. This is done in many ways. For instance, no surgeon would close the abdomen and leave a rent in the parietal or visceral peritonæum. He would carefully suture the edges of the rent together, knowing full well that if he did not adhesions of a dangerous, if not fatal, nature would result.

In the now popular operation of *supravaginal hysterectomy* by the intraperitoneal method, one of the essential steps in the operation, is to carefully suture the peritoneal flaps together.

In looking down into such a pelvis, we see only the bladder in front, the rectum behind, and the whole covered by one unbroken peritoneal membrane, save a transverse row of sutures, holding the flaps in position.

In these cases when the peritoneal flaps are short, I have even pulled down the posterior wall of the bladder to assist in covering the cervical stump.

When removing densely adherent appendages, it often happens that deeply abraded surfaces are exposed. It is imperative that they be dealt with in one of two ways—either they must be drained, or covered in such a manner as to prevent adhesions.

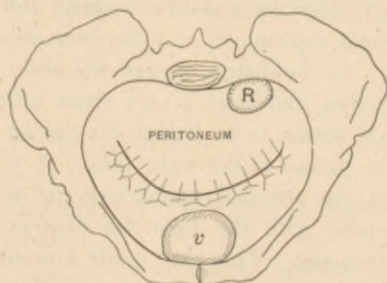


FIG. 3.

It has been my practice, as far as possible, to cover these abraded surfaces with healthy peritonæum. This can not always be done. But the peritonæum covering the lateral walls of the pelvis is rather loosely attached to the underlying tissues and may be made to cover adjacent surfaces. Of course, if the case is septic, no amount of plastic work, however beneficial, can do away with the necessity of drain-

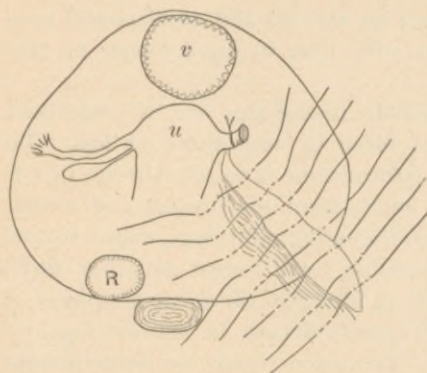


FIG. 4.

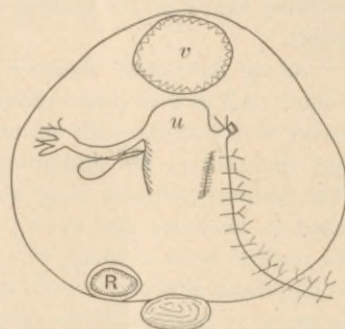


FIG. 5.

age. Not only do we lay bare these abraded surfaces in the removal of adherent pelvic masses, but sometimes the peritonæum is stripped up from the walls of the pelvis and important structures, such as the iliac vessels and ureters are uncovered.

A little plastic surgery will remedy both the abrasion and the tear. By means of a sharply curved needle, armed with a carrier (hospital) No. 2 silk suture catches up the non-abraded edge of the rent, then skipping over the abraded surface, picks up the normal peritonæum. This suture may be continuous or interrupted. A reference to Figs. 4 and 5 will show how the rent is closed and the abrasion covered by the same procedure.

The principle advocated then, of covering all raw and torn surface with normal peritonæum, whenever practicable, to prevent harmful adhesions is susceptible of wide application, but need not be further elaborated in this connection.

Plastic work is of unquestionable value in *wounds of the abdominal viscera*, and in *anastomotic operations*. The principle is the same in both instances; *i. e.*, to bring peritonæum against peritonæum, when the plastic lymph quickly seals the wound in the viscus.

It will be understood that I speak now only of the part which the

peritonæum plays in these plastic operations, and do not consider the other very important and essential factor, namely approximation of the deeper structure of the viscera. Indeed, in some instances it is necessary to bring together only the peritoneal coat; as for example in cholecystenterostomy.

Dr. Murphy has shown that a peritoneal adhesion one line wide is all sufficient to maintain the anastomosis.

But the value of this procedure for wounds and anastomoses is so obvious that it is trespassing on your time to dwell longer on this point.

As an *hæmostatic measure*, plastic procedures are of undoubted value. All raw or torn surfaces bleed or ooze, more or less. To cover such surfaces with normal peritonæum, is to restrain the bleeding and protect the abdominal cavity from the presence of serum. The instances already cited when discussing adhesions, might also be used to illustrate this point; therefore I will notice only one other. In vaginal hysterectomy, as soon as Douglas' *cul-de-sac* is opened, it is important that the serosa, and vaginal mucosa be sutured together in order to restrain all bleeding. The same should be done in front when the utero-vesical fold is opened. When the operation is completed properly, there is no raw surface left uncovered, hence no hæmorrhage can occur. It must not be understood that under any circumstances is it intended for plastic work to take the place of thoroughly ligating all bleeding vessels.

Plastic work is also of great service as an *aseptic measure*, because it has been clearly shown that pathogenic germs increase more rapidly when the peritonæum is unable to absorb the liquids which are poured into its cavity. In other words, they flourish more abundantly in a moist than in a dry field. Hence if by plastic work we leave only normal peritoneal surfaces in the abdominal cavity, we not only have the best possible conditions for absorption, but we lessen the amount of the hæmorrhage and serous exudation and rob any infectious germs, which by chance may have found their way into the peritoneal cavity, of the pabulum that is conducive to their development.

We may sum up the ideas which have been so imperfectly presented in this paper, by saying that plastic work is of value in peritoneal operations:

1. Because it prevents pathological adhesions.
2. Because it induces protective adhesions.
3. Because it is an hæmostatic measure.
4. Because it promotes asepsis.

