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THE EXPLORATION OF THE ABDOMEN AS AN ADJUNCT TO EVERY CELIOTOMY.

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I HAD occasion in several instances some sixteen years ago, to make post-morten examinations and to remove through an opening in the vaginal vault in women, and through the perineum and through the rectum in men various viscera which I was desirous of inspecting.[1] I was enabled in this way to secure specimens not only from any part of the abdominal cavity, but by perforating the diaphragm, from the thorax as well, removing in one instance both heart and lungs. I recall with particular distinctness my first case, a woman with large white kidneys whose history I had followed with unusual interest, and where I had reason to feel assured I would be refused the privilege of an autopsy by the unintelligent relatives, abetted by the undertaker. I was in this instance able to remove both kidneys through the vault of the vagina without leaving any external evidence whatever of the depredation committed.

I cite these cases, not without considerable misgivings as to the propriety of my conduct in thus stealing an autopsy, in order to show how easy it is to reach all the various viscera through an incision

[1] A method of post-mortem examination of the thoracic and abdominal viscera through vagina, perineum and rectum, without incision of the abdominal parietes.—MEDICAL NEWS, June 30, 1883.

as far as possible from the center of the abdomen, large enough to admit the forearm, as well as to urge the propriety, or rather the necessity of making a somewhat analogous investigation of all the abdominal viscera every time the abdomen is opened in the living subject.

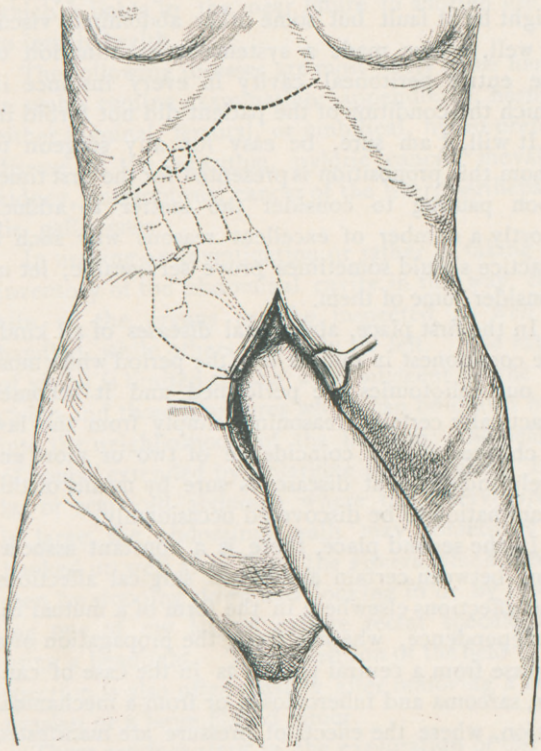
Although I had not infrequently made such examinations from the earliest years of my work, in common I suppose with other surgeons, I was led to adopt the investigation of the abdominal and pelvic organs as a routine plan to be followed in all celiotomies by the following circumstance which caused me no little chagrin. I was treating a woman for pelvic peritonitis with adhesions binding down both tubes and ovaries; I first broke up the adhesions under anesthesia, and then, finding that she continued unrelieved, in December, 1894, I opened the abdomen, brought the adherent tubes and ovaries up out of the incision, carefully freed all adhesions and returned the now fairly normal organs, and finished by suspending the retroflexed uterus.

She passed entirely out of my hands and I did not hear from her again further than to realize that the success of my work was but a qualified one, until a number of months had elapsed, when she wrote from a distant point saying that she had undergone an operation for chronic appendicitis by which she had been entirely relieved, and that she was convinced that this had been the real cause of all her discomforts as well as of the pelvic inflammation which I had been treating.

Whether the reproach was deserved in this case I

have had no means since then of deciding, but I acted upon the assumption that I was blamable for

FIG. 1.



Method of exploring the abdominal viscera.

neglect and took the lesson to heart, and have ever since that date inspected the vermiform appendix in every instance in which I have made an abdominal

incision large enough to permit such an examination, and have recorded its condition in writing on a slip kept by the anesthetizer during the operation; furthermore, realizing that not only the appendix might be at fault but some other abdominal viscus as well, I have made a systematic examination of the entire peritoneal cavity in every instance in which the condition of the patient did not forbid it.

It will, I am sure, be easy for any surgeon to whom this proposition is presented for the first time, upon pausing to consider the matter to adduce shortly a number of excellent reasons why such a practice should sometimes prove serviceable; let us consider some of them.

In the first place, abdominal diseases of all kinds are commonest in middle life, the period when most of our celiotomies are performed and it becomes practically certain, reasoning simply from the law of chances, that a coincidence of two or more entirely independent diseases is sure by means of this examination to be discovered occasionally.

In the second place, there is a constant association between certain abdominal surgical affections and affections elsewhere in the form of a mutual interdependence, whether from the propagation of a disease from a central point, as in the case of cancer, sarcoma and tuberculosis, or from a mechanical action, where the effects of pressure are manifested near to or at a distance from the seat of the disease, as in the case of pelvic tumors or inflammation obstructing the vascular, the urinary or the alimentary channels.

In the third place, such an examination if nega-

ative gives both operator and patient a comfortable assurance that the convalescence will progress without interruption, as well as the satisfaction of realizing that there is no visceral affection in progress which is liable in the near future to shorten life or to impair health.

The following diseases are most likely to be found in such a routine examination: appendicitis, hernia, either inguinal, femoral, or umbilical, hydro-ureter, disease of the omentum, pyloric cancer, movable kidney, enteroptosis, cancer of the liver, perihepatitis, gall-stones.

In making an investigation, or rather in taking an inventory of the abdominal cavity in this way, certain of the organs can be inspected as well as handled, while others can only be felt. The range of vision is limited to the area adjacent to the incision and those structures which can be drawn over into the neighborhood of the incision; the field is of course extended by enlarging the incision. In a lax or scaphoid abdomen where the reserve space is large, the abdominal walls may sometimes be hooked up well away from the viscera, which can be seen by stooping down and looking in or by inserting one of my largest calibre rectal specula and using a headlight. This extension of the field of inspection is also often feasible after removing a large ovarian or a large fibroid tumor.

There are four steps in the exploration of the abdomen:

First, the simple inspection of such structures as can be seen in the neighborhood of the incision by drawing the lips of the incision widely apart.

Second, the examination of those structures which can be brought into view by inserting two fingers through a small incision and catching structures near by, such as ovaries, tubes, cecum and appendix, as well as uterus.

Third, by the insertion of the hand as far as the wrist, by which the colon and the stomach and the pylorus can be grasped and palpated or pulled down, and

Fourth, by the insertion of the forearm in order to reach the liver, the gall-bladder, the kidneys and the spleen.

The technique of such an exploration is this: extreme care must be taken to maintain asepsis by thoroughly sterilizing the arm or by wearing a rubber glove with a long sleeve reaching as far as the elbow, which I have had made for this particular purpose. (See fig. 2.) If the field of the operation, that is to say the area in the immediate neighborhood of the incision, is so septic as to demand the use of drainage, then the operator would best forego the advantage of the more extended examination on account of the risk of distributing the septic material.

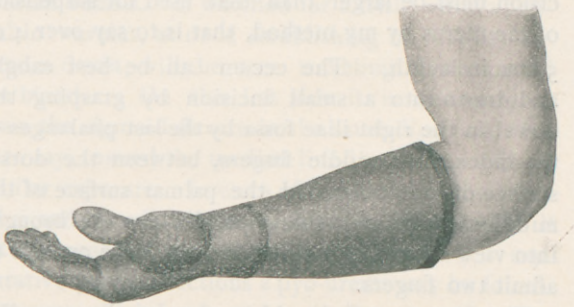
The length of incision necessary for a complete exploration of the abdomen must vary from ten or twelve centimeters up to fifteen (6 to 9 inches)according to the size of the operator's forearm; it must be so large that he runs no risk of bruising the tissues by forcing in the arm through a tight opening.

The best posture in which to examine the patient is either lying flat on the table, or with the pelvis slightly elevated; a decided elevation often causes

the appendix to gravitate up out of reach for inspection unless one uses dangerous traction on the cecum to bring it down.

The various structures are examined in an order which must vary with the location of the incision; when the abdominal opening is made low down over the middle of the pelvis, I commonly follow some such routine as this; after carefully noting the condition of each pelvic viscus, uterus, tubes, ovaries, bladder and rectum, I then look at the internal inguinal

FIG. 2.



Rubber gauntlet.

rings, locating them if necessary by the round ligaments, and test them with the index finger to see if there exists a hernia, and if so I proceed to sew it up at once from the inside of the abdomen, first passing the needle through the outer pillar of the ring and then through the inner, using one or two mattress sutures of silk; another row of sutures draws the peritoneum over the first line so as to bury them; in this way the hernia is closed from the inside, the side on which the pressure falls first and, therefore

in the position of the greatest mechanical advantage.

The umbilical ring is next examined, and if there is an opening it must be closed in like manner from the inside with one or two mattress sutures. The bladder is then examined for adhesions, which are often found on its peritoneal surface. The rectum also will often be found involved in a pelvic peritonitis, especially near the pelvic floor.

The next point of importance is the vermiform appendix, for which the pelvis ought not be elevated at all. Unless the abdominal walls are thin, the incision must be larger than that used for suspension of the uterus by my method, that is to say over 4 or 5 cm. in length. The cecum can be best caught and drawn into a small incision by grasping the bowel in the right iliac fossa by the last phalanges of the index and middle fingers, between the dorsal surface of the index and the palmar surface of the middle; in this way the appendix can be brought into view when the incision is only large enough to admit two fingers.

The cecum secured and brought out, the appendix is traced by following the anterior band of longitudinal muscular fibers, and when found it should be removed if it shows any traces of previous inflammation. In a series of 115 cases in which the condition of the appendix was noted at the operation, it was found adhering to the right tube or ovary in 10 cases, in 37 cases it was involved in adhesions, it was congested in 3 cases, and obliterated at the cecal end in 1 case. Only 64 appendices were perfectly normal.

In a series of 200 abdominal sections I have had occasion to remove the appendix 25 times.

The routine inspection of the ureters in gynecological operations is perhaps as important as that of any other abdominal organ after the appendix, and for this reason every surgeon should be thoroughly familiar with the ureteral landmarks. The best place to find the ureters is where they lie upon the common iliac arteries at the pelvic brim; on the right side the ureter may be seen, upon lifting up the inner border of the cecum, crossing the brim with the ovarian vessels. If watched for a little while a peristaltic wavelet, at once establishing its identity beyond a doubt, will be seen traveling down toward the bladder. On the left side it is necessary to draw the sigmoid flexure in the same direction, that is to say, toward the median line,in order to affect a similar exposure. In cases of carcinoma and myoma uteri and ovarian cysts such an examination will often reveal the presence of a hydro-ureter, in suppurative pelvic affections a pyo-ureter may be found.

A case which I operated on in Paterson, New Jersey, at the request of Dr. J. C. McCoy, serves beautifully to illustrate the point I wish to make here. The patient had a fibroid uterus reaching as high as the umbilicus, and altogether about as large as a six-months' pregnancy. I removed it by my method of supravaginal amputation, cutting from left to right. I then examined the adjacent structures and found the appendix bound down by adhesions in the pelvis and removed it. Then after stating to a number of gentlemen who were present, the importance of examining the ureters also in such

cases, I proceeded to investigate carefully and found on the right side an extensive pyo-ureter leading up to a pyonephrosis, whose presence there had been no clinical reason whatever to suspect.

I accounted for the pyonephrosis in the following manner: the myomatous uterus which filled the pelvis had backed up the urine by pressure at the brim causing a hydro-ureter and a hydronephrosis, then came the appendicitis adding the element of infection conveyed through the tip of the appendix which I found firmly soldered down in the pelvis upon the ureter about 4 cm. below the brim of the pelvis.

Dr. McCoy at a later date removed the right kidney, completely curing the patient. By making a routine examination of and discovering the complication at the first operation, I saved myself the possible, and I think proper, imputation of having ligated the ureter, and so of having caused the pyelonephrosis, I furthermore made an accurate diagnosis as to the presence and location of the complication and determined that the opposite side was unaffected, so making the subsequent operation a safe instead of a hazardous undertaking.

The position of the transverse colon and the stomach are to be noted on account of the frequency of enteroptosis.

Up to this point it has only been necessary to introduce the hand as far as the wrist, it now becomes necessary to introduce the forearm, and for this purpose the edges of the incision are protected with gauze, and the omentum held down while the hand is pushed in, in front of it, with fingers extended and thumb pressed into the palm so as to take up

less space. Whichever hand the operator uses he should stand on the corresponding side of the patient and push the hand first back into one flank and then into the other and thus palpate both the kidneys, noting their presence, size, form, and mobility by sliding them up and down. The renal pelvis may be felt and inverted towards the calices to detect a stone. After the kidneys, the liver is felt, its apparent size, the regularity of its surface, its margin, any adhesions which when present indicate perihepatitis. Most of all, the superior viscera the gall-bladder is next located by feeling the fissure between the right and left lobes of the liver and then palpating across the lobus quadratus to the depression on its right side where the gall-bladder is found, as a rule, well distended.

By taking it between the thumb and two fingers and squeezing it with moderate force, a healthy gall-bladder collapses slowly as the bile is forced out into the hepatic and common ducts. Not infrequently on recovering from the anesthetic such a patient vomits at once a quantity of golden-yellow bile. When the gall-bladder is collapsed one can then readily feel a stone if it be present, by pressing its walls together.

I next put my index-finger in the foramen of Winslow, easily found below the gall-bladder, and palpate the hepaticoduodenal ligament and trace the common duct down for several centimeters, feeling for a stone there. The spleen may then be felt, taking the stomach as a guide.

Finally the pancreas is found by carrying the

hand in under the omentum and palpating through the transverse mesocolon.

The aorta may be palpated thoughout the entire length of its abdominal portion by pressing the fingers back against the vertebral column as the hand is withdrawn.

In a case of Dr. G. P. Yost's, in which a patient convalescent from typhoid fever was suddenly seized with severe pains, marked elevation of temperature, and had a decided distention of the abdomen, there was reason to suspect an attack of acute appendicitis or perforation of the intestine. In this instance I made an incision just inside the anterior superior spine of the ilium, and finding the bowel and appendix normal but the peritoneum everywhere in a state of subacute inflammation, and the abdominal cavity full of a dark thickish fluid, I explored the rest of the abdomen through the incision and was rewarded by finding a gall-stone in the bladder. A close examination of the fluid showed that it was probably bile, and the diagnosis of ruptured gall-bladder following typhoid fever was therefore made and the abdomen opened above, the stone removed and the gall-bladder drained and the patient recovered.

In another instance in which the patient located her pains under the liver and there was every reason to suspect the presence of gall-stones, upon finding none I palpated all of the abdominal viscera through the incision made in the linea semilunaris just below the ribs and found far down on the pelvic floor a large hematoma of the left ovary which was at once removed by a suprapubic incision.

I shall not pause to cite cases in which isolated carcinomatous nodules have been found upon carefully searching through the omentum, or enlarged mesenteric glands in peritoneal tuberculosis; or in other cases in which a carcinomatous infiltration has been discovered in the pylorus or nodules in the liver, in each instance materially affecting the prognosis as to complete recovery.

In cases liable to metastasis, such as those just cited, it is my practice to reverse the order of the investigation wherever possible, making the exploration of the abdominal viscera first and then doing the operation. If I find a metastasis which is out of the reach of surgery, I would not then feel justified in taking the same risks in removing say an advanced carcinoma in the pelvis.

In conclusion let me recapitulate and restate the points I desire to emphasize presenting them from a slightly different standpoint.

The important lesson I wish to inculcate is that, provided an incision has been made in the abdominal parieties large enough to admit the entire hand and therefore the forearm, it is always an advantage to the patient to be able to assure him that as far as touch could ascertain there is no disease of any other abdominal organ.

Under some circumstances where there is reason to suspect disease of one of the other viscera not in the proximity of the field of operation, I would make a larger incision than necessary for the performance of the operation for the very purpose of making such an exploration.

There are in general three classes of cases to which this extended examination may be applied:

Firstly, those in which there has been no reason to anticipate any disease of any other organ and the examination is made simply as a routine procedure, whenever it adds nothing to the gravity of the situation. In such cases we are most liable to find unsuspected hydro-ureter, appendicitis, movable kidney, gall-stones, and occasionally pyloric tumor.

Secondly, those cases in which on opening the abdomen, contrary to expectation no disease is found near at hand. The operator may then find it of great advantage to enlarge the incision, introduce the hand and the forearm and explore the entire abdomen. I have cited a case of this sort in which I made an incision over the appendix and finding no appendicitis, enlarged the opening and found a gall-stone within a ruptured gall-bladder; also, another case in which gall-stones were believed to be present, but in finding the diagnosis at fault I introduced my arm through the enlarged incision and found a large hematoma of the ovary.

Thirdly, the group of cases in which there is a definite percentage of chances that the disease discovered at the time of operation is complicated by the affection of some other organ neighboring or remote. In cancer of the ovary I examine all the organs and in no small percentage of cases have the disappointment of finding metastases in the omentum pylorus, or liver. In pelvic inflammatory disease the appendix will be frequently found involved, and in the case of pelvic tumors as well as inflammation the ureters are prone to suffer from compression.