

DEATH FROM VISCERAL AFFECTIONS AFTER OVARIOTOMY.¹

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A VERSATILE medical novelist not long since presented in a modern form the old idea that physical immortality lies more or less within our control—an idea which, fanciful as it may appear from a scientific standpoint, contains a germ of truth. It is, at least, more rational than the recent absurd theory on this subject. A few years ago any laparotomist who asserted that he could, by adopting a few simple precautions, reduce his death-rate to the extent which is possible at the present day, would have been regarded as no less an enthusiast than the savant who would have us believe that he has found the lost recipe for the elixir of life.

In no other branch of surgery has there been such a steady improvement in statistics as in abdominal section for the removal of diseased ovaries and tubes. This is evident from a comparative study of the earlier and recent results of individual operators, of the reports of various hospitals, and, finally, of the collected statistics of all the prominent laparotomists in our own country and abroad. We need not look far in order to find the cause of this improvement. It lies in the increasing tendency to simplify the details of the operation

¹ This paper is in effect an abstract, which simply presents a brief statement of the writer's personal observations. In order to make it as concise as possible, he has omitted reports of autopsies and extended references to the literature of the subject.

and the after-treatment. At the same time, the natural proportion of bad cases is such that unusually favorable results reported by an individual operator always awaken a certain suspicion on the part of his less fortunate *confrères* that he has, either intentionally or unwittingly, concealed some of the facts. There is always an inclination to regard some deaths as "mysterious dispensations of Providence." It is the purpose of this paper to examine such cases by the light of positive anatomical evidence, with the view of determining how far the fatal results are preventable, and if even the most favorable statistics are not susceptible of improvement. I intentionally omit all reference to supra-pubic amputation of the uterus, not only because the operation is more serious than ovariectomy and involves special dangers, but because operations of this character are relatively few in number.

By the earlier ovariectomists fatal cases were usually grouped under three heads, viz.: deaths from the immediate effects of the operation (shock or hemorrhage), from peritonitis, and from septicæmia. Only surgeons of wide experience, like Sir Spencer Wells, noted an occasional death from tetanus, or from some visceral complication. The reason why the latter was not more frequently observed was doubtless due to the fact that laparotomy was formerly regarded as a far more serious procedure than it is now, so that a patient with recognized organic disease of one of the thoracic or abdominal viscera was not considered a proper subject for operation. Hence the long list of contra-indications in the earlier editions of text-books. "Septic peritonitis" was the great bugbear of ovariectomists, and the escape of pus or colloid material into the peritoneal cavity was thought to have practically sealed the doom of the patient. After peritonitis had fully developed hope was almost abandoned, the surgeon's efforts being directed to relieving pain and lowering the temperature. The heroic hydro-pathic treatment adopted in this country for the latter purpose was doubtless responsible for some of the fatal results. Old reports of autopsies show that the condition found after death

was almost invariably intense general peritonitis with an effusion of acrid, purulent fluid, the inflammatory process usually originating in the immediate neighborhood of the stump. If this process began soon after operation, it was regarded as traumatic peritonitis; if it developed several days after, and was more insidious in its course, the term "septic" was applied to it. This distinction was rather clinical than anatomical, since the appearances after death in both cases were often identical.

It is often extremely difficult to decide as to the direct cause of death after ovariectomy and removal of the adnexa. Even the pathologist, who possesses the additional advantage of being able to compare the clinical with the anatomical evidence, is sometimes quite as much at a loss for a satisfactory explanation as the surgeon. Unfortunately, many so-called autopsies upon the bodies of patients dying after laparotomy are very imperfect (at least this is the case at the Woman's Hospital), an opportunity of examining the brain and spinal cord seldom being afforded. Too often the examination consists in simply enlarging the incision and making a hasty inspection of the pelvic viscera, the presence of a little purulent fluid and a few peritoneal adhesions being regarded as sufficient evidence of the cause of death. The reports of such post-mortems possess no value as scientific data, and in many of these cases we are compelled to believe that the true cause of death was not discovered. In quoting from reports of autopsies, I would be understood as referring only to those cases in which a thorough examination of the viscera was made.

The principal visceral affections to which I have attributed death after laparotomy may be considered in the following order: cardiac, pulmonary, renal, and gastro-intestinal.¹

¹ Herff read a paper before the German Gynecological Society in June, 1889, in which he described various fatal cardiac, pulmonary, and renal lesions which followed the prolonged use of chloroform during ovariectomy. Since it is seldom used by American laparotomists, the writer has not thought it necessary to dwell upon the injurious effects of anesthetics, which might follow any

I. CARDIAC AFFECTIONS.

They may exist before operation, or may develop subsequently.

1. PRE-EXISTING CARDIAC DISEASE is not uncommon in connection with ovarian tumors, but a direct causal relation between them can only be established in the case of hypertrophy and dilatation of the heart—a condition which doubtless explains many sudden deaths both before and after operation. I have never been able to attribute death after laparotomy to a valvular lesion with compensatory hypertrophy, since in my experience the laboring heart is actually relieved by the removal of the tumor, although I have observed most alarming symptoms in a patient with this condition when on the operating-table and immediately after being removed to bed. Slight dilatation, fatty degeneration, and cardiac neuroses, which often escape recognition, are really more dangerous in this connection than is a moderate degree of mitral stenosis. The occurrence of sudden cardiac paralysis was well illustrated in the case of a patient under my care while interne in the Woman's Hospital, who, on the eve of an operation for the removal of a fibro-cystic tumor of the uterus, suddenly collapsed and died while lying quietly in bed. The autopsy failed to disclose any abnormality except slight dilatation of the right cavities of the heart, which were filled with fluid blood. The tributary vessels of the tumor were enormously distended, some of the veins being as large as the femoral. Death was undoubtedly due to true paralysis of the heart, and there appeared to be no doubt that operative interference would have been fatal from a similar cause. On the other hand, it is conceivable that the extra strain thrown upon the heart might have been relieved by the removal of the tumor. Yet a patient with such a condition,

lengthy operation. It is interesting to note that, in discussing Herff's paper, the prominent German surgeons were unanimous in the opinion that chloroform was less safe than ether in the case of a patient with albuminuria.

although experiencing but slight shock at the time of the operation, might mysteriously succumb a week after without having presented any septic symptoms. In fact, in subjects with so-called "septic peritonitis," the dilated condition of the right ventricle often observed suggests the possibility that cardiac failure, and not general infection, was the immediate cause of death—an inference justified by the clinical history of such cases.

Fatty degeneration of the heart is a dangerous complication that often escapes notice until the autopsy. While it is properly regarded as a contra-indication to such a serious operation as ovariectomy, the clinical symptoms are often so vague that they might readily be attributed to the presence of the morbid growth alone. I recall three cases in which patients who were supposed to be perfectly healthy were seized with fatal angina when convalescing from minor gynecological operations; the autopsy in each instance revealed atheroma of the coronary arteries and fatty degeneration of the cardiac muscle. The same condition existed in a stout woman who expired suddenly on the fourth day after laparotomy, when progressing favorably.

2. CARDIAC DISEASE MAY DEVELOP AFTER THE OPERATION.—I know that positive anatomical proof is often wanting, but enough has been accumulated to explain the clinical symptoms in cases where post-mortem verification is wanting. The phenomena observed after the removal of large vascular tumors, which may be called "prolonged shock," are due, I believe, quite as much to the disturbance of the cardiac equilibrium, consequent upon the sudden withdrawal from the circulation of a large amount of blood, as it is to actual hemorrhage, to long exposure and handling of the abdominal viscera, or to some occult influence of the large nerve-plexuses, as suggested by physiologists. It is well known that some patients after an ovariectomy that did not present especial complications remain for several hours, or even days, in a state of shock and then die without presenting any symptom

except feeble and irregular heart-action. On examination we find no organic lesion of the heart; the right cavities are filled with fluid blood, but the organ is to all intents normal. I have noted the same fatal result after a prolonged labor, terminated instrumentally. Of course, heart-failure may be due to the continuous high temperature attending septicæmia. To the anatomical change in the cardiac muscle, known as "brown atrophy," Gusserow attributes several of his deaths after laparotomy. Whatever may be its true pathological importance, this change is certainly not an uncommon one, nor is it always proportionate to the intensity of the septic process. It accounts satisfactorily for the sudden demise of patients with high temperature, whose general condition may have given no cause for alarm. The same condition is noted in typhoid fever.

Operators are constantly surprised by the unexpected fatal termination of apparently favorable cases. Patients with peritonitis and well-marked septic symptoms recover; why do others with slight localized inflammation succumb? I think that additional observations will only tend to confirm the opinion already expressed—that these are cases of heart-failure, in a considerable number of which the serious consequences might have been foreseen and prevented. High temperature is not the only cause of secondary cardiac trouble after laparotomy; complications in other organs are not without a direct influence on the heart. Hypostatic pneumonia has been assigned as the cause of sudden deaths without marked symptoms. The lower lobes of the lungs may, indeed, be affected, but the extreme engorgement of the heart which is often present suggests as the true cause of death paralysis of the latter organ, since the lungs were not seriously crippled. The distention of the stomach and intestines, so common after ovariectomy, even when there is not a trace of peritonitis, may give rise to cardiac disturbance, which, if prolonged, might become serious; the slight dislocation of a diseased or overburdened heart, thus occasioned, might be fatal. I have

noted alarming, though temporary, symptoms which could only be attributed to this cause. Reflex irritation of the heart of obscure origin occurs not infrequently after abdominal section. Careful observers have explained the phenomenon by reference to the necrobiosis of a large amount of tissue in the stump, to the ligation of portions of the omentum *en masse*, etc. I have observed a similar cardiac disturbance from the rupture of a mural abscess into the peritoneal cavity before peritonitis had developed. The character of the disturbance suggests reflex irritation through the medium of the abdominal sympathetic plexuses.

II. PULMONARY AFFECTIONS.

The condition of the lungs is sometimes directly responsible for the fatal termination of cases of abdominal section. Pulmonary affections may also be divided into preëxisting lesions and those which develop after the operation.

1. PRE-EXISTING AFFECTIONS.—It is surprising what extensive pulmonary lesions may be present in patients with abdominal tumors, without attracting the notice of the gynecologist, whose attention is often directed so exclusively to the neoplasm which he expects to remove, that he forgets that existing symptoms may be due to independent complications. Dyspnoea in connection with a large ovarian cyst is invariably attributed to mechanical pressure, when it may have an entirely different origin. I once saw a patient die in the etherizing-room; on opening her thorax I found double pleurisy with effusion, probably of long standing. The dyspnoea of which she had complained had been attributed to the presence of an ovarian cyst with moderate ascites. Another patient with unilateral pleurisy survived laparotomy only three or four days.

Pleurisy as a complication of ovarian cyst is an extremely important subject, to which attention has recently been directed by Démons (*Ann. de Gyn. et d'Obstétrique*, June, 1888), who

claims to have recognized it in nearly twenty per cent. of his cases. The discussion of his paper, read before the French Academy, by Terrier, Verneuil, Charpentier, and Pajot, showed that these gentlemen had frequently observed this complication. It may accompany small, non-malignant ovarian cysts, or, in fact, any abdominal tumor (Verneuil). It has been attributed to lymphatic obstruction, but the fact that it sometimes develops on the side *opposite* to the cyst (when the latter is small) suggests the theory of reflex irritation and hyperæmia; in support of the latter view, is the fact that unilateral pleurisy is sometimes observed in connection with cystic degeneration of the ovary. Terrier has remarked that when the pleuritic effusion is due to the pressure of the tumor alone, it disappears after the growth has been removed. His practice is to puncture the pleural cavity before operation if the dyspnœa is marked. Old pleuritic adhesions are so frequently found at the post-mortem table that their presence would not be referred to in this connection, except for their bearing upon fatal pulmonary complications arising after laparotomy. A feeble patient develops mild peritonitis after operation, and the movements of the diaphragm are consequently restricted. She has pleuritic adhesions that still further limit the expansion and contraction of the lungs. Pulmonary œdema naturally follows and proves fatal; she really succumbs to this complication and not to peritonitis, as the surgeon notes in his statistics. The frequency with which old phthisical cavities, cheesy foci, and chronic bronchial catarrh are found at autopsies explains the urgent dyspnœa observed in such patients when their breathing-space is still further encroached upon by abdominal enlargement. Acute bronchitis and pneumonia, following prolonged etherization, undue exposure, or the careless administration of liquid nourishment, may rapidly prove fatal in such cases, as I have noted.

2. LESIONS PRODUCED AFTER THE OPERATION.—Excluding such cases as have been mentioned, in which acute may

complicate chronic pulmonary affections, it is well known that a certain percentage of laparotomy patients die from pneumonia, although the number of reported deaths from this cause is certainly too small. Aside from the causes before mentioned, the sudden alteration in the pulmonary circulation consequent upon the removal of a large neoplasm, prolonged rest in the dorsal posture (which used to be insisted on so strenuously), all lead directly to pulmonary œdema and hypostatic pneumonia, the treatment of which is especially difficult under the circumstances. In one autopsy I found extensive gangrene of the right lower lobe, due to inhalation of acid fluid which had been regurgitated from the stomach and filled the terminal bronchioles.

It is important in tracing the cause of death in these cases to ascertain whether the pulmonary lesion is of independent origin, or is merely a complication of the general infection, as in metastatic pleuro-pneumonia during pyæmia, etc. The ordinary congestion and œdema which develop just before death must be carefully excluded. Acute lobar pneumonia is a rare complication, so far as my observation extends, broncho-pneumonia being far more common.

III. RENAL AFFECTIONS.

Renal complications before and after laparotomy are not only very important, but are most difficult to recognize clinically. While pathological changes in the kidneys are not infrequently found in subjects who die within a few days after operation, it is often impossible to decide whether these existed before laparotomy, or are more acute in their development. Renal affections are frequently overlooked by surgeons, or else their importance is not properly estimated. Of this I was convinced eight years ago, when making a special study of the subject of albuminuria as a contra-indication to laparotomy. Inquiries addressed to a number of prominent operators showed that some regarded it as a positive contra-

indication, others as of no significance, and others never examined their patient's urine at all. I discussed this question in a paper, entitled, "Contra-indications to Laparotomy, etc." (*New York Medical Journal*, October, 1885).

Albuminuria (excluding cases in which the albumin is due to catarrh of the genito-urinary tract) is frequently noted in patients with abdominal tumors, and in the majority of cases it is merely the result of pressure, as in pregnancy, and disappears after the removal of the tumor. But in a certain number of cases careful microscopical examination of the urine reveals evidences of organic renal changes. Even these do not absolutely forbid operative interference; in fact, I have seen decided improvement in patients with contracted kidneys after removal of ovarian cysts. On the other hand, this complication may prove fatal if after operation acute congestion is added to the chronic lesion.

Among the chronic affections of the kidney which I have noted in this connection are chronic interstitial and diffuse nephritis, chronic pyelitis and pyonephritis, and hydro-nephrosis. In one of the latter cases the point of obstruction was at the exit of the ureter from the renal pelvis, so that the condition was not due to the pressure of the tumor. The sound kidney was intensely congested and the patient died with symptoms of uræmia, although there was not complete suppression.

In one very interesting case of laparotomy for spindle-celled sarcoma of the ovary, in which the patient was said to have died of exhaustion (?), the extensive ascites was found to be due to a curious displacement of the left kidney; the organ was (in consequence of former perinephritis and interstitial nephritis) transformed into a mass of dense cicatricial tissue, which was drawn over to the median line, so as to lie directly over the vena cava and partially to occlude it. The opposite kidney had become diseased in consequence of its abnormal functional activity. Complete suppression of urine after laparotomy in patients whose urine was previously

normal is comparatively rare, and suggests the presence of a grave lesion of the kidneys, yet I have never happened to find under these circumstances any changes except very intense and general congestion of the glands. I have often regarded with distrust the diagnosis "uræmia" as applied to fatal cases in which the symptoms were obscure and of a cerebral character. In many of these cases where no careful examination of the urine was made during life (especially with reference to the amount of urea) and the kidneys showed no evidences of organic disease, I have been inclined to attribute the symptoms to septicæmia. Still, true uræmia from suppression does occur, though less often than is supposed. When it does, I have usually been able to demonstrate the presence of pre-existing renal disease with an acute exacerbation.

Among the renal affections that were noted as developing *de novo* after operation should be mentioned congestion, acute pyelitis and interstitial nephritis, and acute hydronephrosis. Passive congestion is so common in connection with all of the fatal complications as to require no attention. Acute hyperæmia is a condition of greater significance; I have observed it so intense as to result in punctate hemorrhages, although I have, of course, never been able to attribute death directly to uncomplicated hyperæmia of both kidneys; if it occurs in a previously healthy organ when the other is already crippled by chronic disease, suppression and death may result, as before stated.

Acute pyelitis and interstitial nephritis (surgical kidney) have been noted in a few cases, in which acute cystitis developed after operation, either primarily or in consequence of long-standing vesical catarrh. There is no doubt that bladder troubles have become less frequent since patients have been allowed to pass their water. In two instances I have noted the development of pyelitis following cystitis, which was due to vesico-intestinal and vesico-abdominal fistulæ; one patient recovered and one died.

Acute hydronephrosis is an inevitable consequence of ligation of the ureter, an accident which is not unheard-of during the enucleation of deep-seated, sessile ovarian cysts, especially those which develop between the folds of the broad ligaments. This mischance has proved fatal, especially if extra work was thrown upon the other kidney when the latter was already diseased. Simultaneous ligation of both ureters during the removal of an abdominal tumor I have never observed, although I have seen two cases of vaginal hysterectomy which terminated fatally from this cause. At one autopsy, on a patient dying after ovariectomy, I found unilateral hydro-nephrosis from ligation of the ureter.

IV. AFFECTIONS OF THE GASTRO-INTESTINAL TRACT.

Under these I would include not only inflammations of the mucous lining of the stomach and intestine, but strictures and displacements of the gut due to external causes, especially to peritonitis.

1. INFLAMMATION OF THE GASTRO-INTESTINAL MUCOUS MEMBRANE.—This may be acute or chronic, or, following the order already adopted, it may exist before the operation or may develop subsequently.

a. Pre-existing inflammation.—(a) Of the stomach. Chronic gastric catarrh is quite common in connection with abdominal tumors. Many of my notes show that after death the gastric mucosa presented a brownish or slaty color, with scattered ecchymoses and pigmented spots, and was coated with a thick layer of viscid mucus. It is customary to attribute the frequent gastric irritation to the mechanical pressure of the tumor, which does not allow the stomach to occupy its normal space, but the anatomical condition of the organ, as above described, proves that the irritation is internal rather than external—*i. e.*, it is the result of persistent venous stasis caused by the tumor. It is true that this gastric trouble is generally relieved as soon as the growth is removed, but in

some cases there is such marked gastritis that it seriously complicates the operation. I have notes of two or three cases in which vomiting from this cause was absolutely uncontrollable, so that the patients actually died of exhaustion without high temperature or other evidences of septicæmia or peritonitis. These cases are rare, and must be carefully distinguished from those in which gastric derangement is merely a symptom of one of the two latter conditions. Undoubtedly in these cases acute inflammation is superadded, as in the chronic affections of other viscera. A remarkable instance of the result of this complication was presented in the case of acute dilatation of the stomach reported *in extenso* at a former meeting of this Society by the late Dr. J. B. Hunter. In my pathological report, appended to the paper, I expressed the opinion that the walls of the stomach had become thinned and weakened in consequence of long-standing chronic inflammation. While such extreme dilatation after laparotomy as that which occurred in this instance is very rare (not more than a half a dozen cases having been recorded), I have several times observed moderate dilatation with atrophy of the coat of the stomach—clearly the result of chronic inflammation.

(b) *Chronic inflammation of the intestinal mucous membrane*, which may seriously affect the result of laparotomy, is, so far as my observation goes, mainly confined to the colon. In one case an acute inflammation was grafted upon a chronic colitis, resulting in extensive sloughing of the wall of the ascending colon, perforation and general peritonitis, which terminated fatally less than a week after the operation. The existence of the local lesion was entirely unsuspected during life. Chronic colitis (and especially proctitis) may constitute a formidable complication in cases in which it is necessary to feed *per rectum*, as the gut becomes highly intolerant of foreign material. In this connection reference should be made to complete laceration of the sphincter—a condition which may have an important bearing upon the recovery of a patient. Thus, an individual with this lesion, who was under my care after

laparotomy, nearly died of exhaustion because she could not retain nourishment either in the stomach or in the bowel.

Among the results of chronic colitis is stricture of the gut, which is, as a rule, only partial and is therefore unsuspected. But after operation the portion of intestine above the stricture may become distended with gas (even though peritonitis is absent), a bend is formed and complete obstruction results. In two autopsies I attributed death to this cause, the circulation in the wall of the gut being cut off and general inflammation of the peritoneal coat following. The recognition of this condition is practically impossible, unless the existence of an old stricture was previously known, because the sudden onset of the symptoms always suggests an acute obstruction. I was once able to reach, but not to pass, such an obstruction with a long French rectal tube; a secondary laparotomy terminated fatally.

b. Inflammation of the gastro-intestinal mucous membrane after operation.—(a) *Of the stomach.* Acute congestion and catarrh of the stomach are met with not infrequently, especially in connection with general peritonitis. It may constitute a serious complication in the case of a feeble patient, who is consequently unable to retain nourishment, although I have not seen a case in which death was due directly to this cause.

(b) *Of the intestine.* Diarrhœa from primary intestinal catarrh is to be distinguished from that due to septicæmia, of which it is a common symptom. I recall the case of a patient, much enfeebled by loss of blood during the operation, who was carried off in a few hours by a sharp attack of diarrhœa. Gastro-enteritis occurring under these circumstances is naturally very intractable.

2. AFFECTIONS OF THE INTESTINE DUE TO EXTRINSIC CAUSES.—Under this head are included the results of peritonitis—false bands or adhesions which imprison or constrict the gut to a greater or less extent. It would be interesting to study at some length the effect of such adhesions in causing visceral disease (such as pyelitis from obstruction of the ure-

ters), but this would extend the present paper unduly. We must, accordingly, confine ourselves to disturbances of the intestinal functions. I published a paper two years ago bearing on this point, entitled, "Visceral Affections due to Localized Peritonitis" (*New York Medical Journal*, October, 1888).

a. Adhesions of long standing.—Localized peritonitis is of frequent occurrence, and may be attended with such slight outward manifestations that it escapes the attention of both physician and patient. The evidence in favor of this statement is furnished by the surgeon quite as often as it is by the pathologist. How frequently does the former in searching for the cause of an intestinal obstruction discover extensive adhesions, the presence of which had never been suspected! The ovariologist constantly finds cysts firmly adherent which he had supposed to be entirely movable. The simplest and most aseptic laparotomy may be followed by localized peritonitis; witness the recent statement of Martin, that in *every case* in which he was obliged to operate for a second time upon the same patient he found that the first operation had been followed by more or less extensive peritonitis, even where the convalescence had been entirely normal. The effect of peritonitic adhesions being purely mechanical (producing either traction or compression), will be most marked in the case of the movable and easily compressible intestine. They vary from simple attachment of a loop of small intestine to the abdominal wall, thereby limiting its peristaltic movements, to almost complete constriction. The danger in a given case is by no means directly proportionate to the extent of the adhesion. As before stated, these conditions may give rise to no characteristic symptoms; constipation and occasional colicky pains may be the only evidences of intestinal disturbance. For information on the subject of pain in this connection, see Dr. J. B. Hunter's paper on "Persistent Pain after Abdominal Section" (*Trans. Amer. Gyn. Society*, 1886). After ovariectomy, however, especially when the old practice (happily

becoming obsolete) of keeping the bowels torpid by opium is adopted, the portion of gut immediately above the point of adhesion may become distended and a bend in the loop results, thus obstructing the lumen. Symptoms of obstruction soon appear, and unless the bowels are thoroughly evacuated a fatal result may speedily ensue. When the distended loop cannot be emptied in the usual manner, it may be punctured through the abdominal wall and the obstruction thus removed. I have notes of a fatal case of this character, the obstruction being in the descending colon. The actual narrowing of the lumen by the old adhesion was not such as to interfere with the regular function of the bowels before the operation; within a few hours after laparotomy the patient exhibited signs of complete occlusion, and succumbed in spite of temporary relief afforded by a secondary operation. The obstruction was due to a kink in the distended gut at the usual point above the adhesion. Many cases in which the obstruction is attributed to acute peritonitis are doubtless of this nature.

b. Obstruction of recent origin.—Allusion has been made to the frequency of localized peritonitis after ovariectomy. Intestinal occlusion from this cause is not very rare; Spencer Wells reports eleven fatal cases in one thousand ovariectomies, though one of these does not belong to this category, since the patient died nine years after the operation. Hirsch (*Archiv für Gynäkologie*, Bd. xxxii. Heft 2), who has given special attention to this subject, distinguishes three sources of obstruction from recent adhesions, viz.: a loop of intestine may become adherent to the abdominal wound, occlusion being due to traction of the cicatrix; general aseptic peritonitis may cause adhesion between adjacent coils; or, a loop of gut may become imprisoned between the pedicle and the wall of the pelvis. He does not make a sharp distinction between obstructions that are fatal during the first week or two following laparotomy and cases of death occurring after actual recovery from the operation. Of the former, every surgeon of experience

can recall cases—in fact, we read every month in society-reports of the abdomen being reopened less than a week after laparotomy in order to relieve acute intestinal obstruction. So far as my personal observation goes, I agree with Hirsch regarding the unfavorable prognosis after such secondary operations; of the fourteen cases which he collected, all but one terminated fatally. The importance of this subject cannot be over-estimated. It has attracted considerable attention abroad, as shown by a discussion of Nieberding's paper ("Über Darmverschluss nach Laparotomien") at a meeting of the German Gynecological Society. I believe that the reason why this accident is less common than formerly is because the practice now is to favor peristalsis by moving the bowels early, instead of arresting it by the routine use of opium.

The limits assigned to this paper forbid the consideration of other visceral lesions, such as those of the liver and spleen, as well as of disease or obstruction of the bloodvessels and lymphatics. Although I have met with these conditions in examining the bodies of patients dying after laparotomy, I have always regarded them as complications of a general disease rather than as the direct cause of death. Interesting as it would be to review them, descriptions of these affections belong rather among the details of a post-mortem protocol. Although this paper is too brief and incomplete to warrant me in basing upon it any positive rules for the guidance of the surgeon, the facts which I have sketched in outline are, to my mind, quite convincing. If in my few autopsies upon the bodies of women dying after abdominal section I have found ample evidence that the true cause of death was often unsuspected, the surgeon attributing it to "shock," "septicæmia," "peritonitis," "exhaustion," etc., when it was really due to a visceral lesion, it follows that among the total number of patients (reported and not reported) who die in the course of a year errors in diagnosis are numerous. This is more likely to occur in private practice, where autopsies, if performed at

all, are necessarily incomplete. In short, all statistics of abdominal section contain a radical source of error. Until this error is eliminated by more careful study of the causes of death, surgeons will continue to regard sepsis as the *only* avoidable element of danger, and will be inclined to attribute all their fatal results in uncomplicated cases to some flaw in their antiseptic precautions. In other words, their minds will continue to be fixed upon the wound rather than upon the whole patient.

It has been the object of this paper to point out briefly that women who have conditions which render abdominal section necessary, may have visceral lesions which seriously affect the prognosis of the operation; that these lesions in distant organs may arise directly from the growth, or may be entirely independent of it, and that they may be aggravated by acute hyperæmia or inflammation following the operation, even in the absence of septic or peritonitic complications. Granting, as we must from a review of the anatomical facts, that death may be due directly to such lesions, we may ask, supposing the surgeon operates with a full knowledge of the existence of an unsound heart, lung, or kidneys, can he by any preparatory and after-treatment ward off threatened danger and at least bring the patient in safety through the period of convalescence? I purposely omit any consideration of how far visceral disease should contra-indicate operative interference, as opinions on this subject are too variable to admit of their being formulated.

My own limited observation, both clinical and pathological, leads me to believe that many deaths from so-called "accidental" causes were clearly preventable. They arose from the fact that the operator forgot that he was a physician before he became a surgeon—in short, he failed to adopt the same precautions that he would have employed in an ordinary medical case. It is the standing reproach of gynecologists that as soon as they become pure specialists they are too much inclined to overlook gross lesions outside of the pelvis; in

other words, as their sense of touch becomes more refined their other senses grow less acute. This is a tendency which is especially deplorable in the laparotomist, and materially affects the results of his operations, however perfect may be his technique.

In order to guard intelligently against danger from an unsound organ, the condition of the latter must be recognized before operation. The dashing gynecologist incurs a great risk in appointing an operation for a strange patient after a single hasty interview. Laparotomy has indeed become a simple matter, but it is sufficiently serious to require some preparation on the part of the patient, as well as of the surgeon. There is no reason why the latter should not make a *thorough* examination of the thorax and abdomen as well as of the pelvis; nor should he omit a careful test of the urine. The few extra minutes thus spent will pay, even from the standpoint of statistics. There is no excuse for the omission of this routine in private practice; in hospitals the obtaining of a *trustworthy* report regarding a patient's condition is, strange to say, more difficult. "In the multitude of counsellors there is safety," is a proverb that does not apply to hospital-internes, in the multitude of whom there is confusion. The physical examination of patients about to undergo laparotomy, should, if the operator has not time, be entrusted to a responsible individual (an assistant-surgeon, if such an officer is available) who reports her condition to his chief as soon as possible after her admission—and not just as she is about to be placed upon the operating-table, as is too often the custom. Then, if any serious complication is discovered, she can receive appropriate treatment, and the surgeon can note her improvement and decide at his leisure when the operation can be undertaken with safety, if at all. This is the only rational and scientific mode of procedure.

Every laparotomist of wide experience must recall cases in which the fatal result of a simple operation was due to some visceral lesion which was unsuspected because the patient was

not under observation sufficiently long before the operation. I have noted deaths after abdominal section from fatty degeneration of the heart, chronic Bright's disease, tuberculous peritonitis, cirrhosis of the liver, stricture of the colon, and obstruction of the vena cava inferior—not to speak of several cases of general carcinosis—all of which conditions could hardly have been overlooked had the patient been observed carefully for a few days.

With regard to the special care of these patients demanded after operation, we may summarize in a word—avoid routine. The unintelligent application of certain fixed rules of treatment to all cases has destroyed patients after laparotomy, as well as in acute febrile diseases of a strictly medical type. It is certainly unscientific to follow the ordinary practice of withholding nourishment and stimulants for the first twenty-four or thirty-six hours after operation in the case of a patient with threatening heart-failure, when the indications are clearly to push cardiac stimulants and to keep up the general strength. On the other hand, ordinary common-sense would dictate the suspension of oral alimentation in the case of a patient with an organic affection of the stomach. In abandoning, as we have, the indiscriminate practice of feeding *per rectum*, we have gone to the other extreme and rather undervalue this means of administering drugs and nourishment. We ought from the outset to treat the complication which we have recognized before operation, and never to lose sight of the medical as well as the surgical features of the case, any exacerbation of the former trouble being anxiously watched for. Thus, if the kidneys are known to be affected, the careful surgeon will not wait until the occurrence of suppression and uræmia before seeking to relieve the engorged glands, but he will begin to administer diuretics as soon as possible after the operation, and thus ward off a possible danger. In short, it is wiser to anticipate a complication than to be suddenly surprised and overwhelmed by it. I am aware that these views are at variance with the ordinary rules of after-treatment, but

they are supported by the facts which I have mentioned, and must be approved by those who are not wedded to their own theories in defiance of clinical and anatomical evidence.

Moreover, when a patient begins to exhibit those indefinable evidences of "doing badly," which the experienced recognize but cannot describe, why should we always assume that something is wrong with the wound and reproach ourselves with some omission of antiseptic precautions during the operation? Why not interrogate each viscus for evidences of some complication, as in a case of typhoid fever or pneumonia? The symptoms may be completely masked by abdominal tenderness and distention which seem to point clearly to peritonitis, yet a careful search may reveal the cause of the trouble and suggest the means of removing it. Just as we are sometimes alarmed by a sudden rise of temperature during the puerperium from a very simple cause (mental excitement, constipation, or malaria), so after laparotomy we are always on the lookout for sepsis when the complication may be entirely independent of infection. Yet, if the patient happened to die from an unrecognized visceral affection, and no autopsy was made, the obscure symptoms would almost invariably be attributed to "a low form of septicæmia."

SUMMARY.

A considerable number of deaths after laparotomy, ascribed to sepsis or peritonitis, are directly due to visceral affections which may have been of long standing. The possibility of such complications should always be borne in mind, both before and after the operation, and, when recognized, they should be promptly treated. The systematic adoption of proper precautions in this direction would sensibly diminish the death-rate of abdominal section.

Appended is a table based upon the pathological records of the Woman's Hospital, which extend over a period of nearly twenty years:

TABLE SHOWING SERIOUS VISCERAL LESIONS IN EIGHTY-FIVE CASES OF DEATH FOLLOWING LAPAROTOMY FOR REMOVAL OF OVARIAN CYSTS AND DISEASED APPENDAGES, INCLUDING INCOMPLETE OPERATIONS.

Heart.	Lungs.	Kidneys and Ureters.	Stomach.	Intestines.	Liver.
<p><i>Acute diseases.</i></p> <p>Endocarditis 1</p> <p>Pericarditis 1</p> <p><i>Chronic diseases.</i></p> <p>Dilatation 3</p> <p>Hypertrophy 2</p> <p>Fatty degeneration 3</p> <p>Valvular lesion 1</p>	<p><i>Acute diseases.</i></p> <p>Abscess 1</p> <p>Acute bronchitis and broncho-pneumonia 1</p> <p>Gangrene 1</p> <p>Hydrothorax 1</p> <p>Infarction 2</p> <p>Edema (general) 1</p> <p>Pleurisy¹ 4</p> <p>Pneumonia (lobar) 8</p> <p><i>Chronic diseases.</i></p> <p>Bronchiectasis 1</p> <p>Emphysema (general)¹ 1</p> <p>Phthisis 4</p>	<p><i>Acute diseases.</i></p> <p>Hydronephrosis (ureter tied) 1</p> <p>Hyperemia (leath from uremia) 1</p> <p>Interstitial nephritis 1</p> <p>Parenchymatous degeneration 1</p> <p><i>Chronic diseases.</i></p> <p>Calculi 1</p> <p>Cystic kidney 2</p> <p>Hydronephrosis 8</p> <p>Diffuse nephritis 13</p> <p>Interstitial nephritis 6</p> <p>Pyelitis 2</p> <p>Pyonephrosis 1</p> <p>Dilatation of ureters² 6</p>	<p><i>Acute diseases.</i></p> <p>Moderate dilatation 4</p> <p>Extreme dilatation 1</p> <p>(see Trans. Am. Gyn. Soc., 1887).</p>	<p>Vesico-intestinal fistula 1</p> <p>Duodenal ulcer 1</p> <p>Obstruction from old cicatrix (fatal) 1</p> <p>Acute colitis, perforating ulcer 1</p> <p>Laceration through sphincter 1</p>	<p>Fatty degeneration 1</p> <p>Cirrhosis³ 4</p> <p>Amyloid 1</p> <p>Old abscesses 1</p> <p>Perihepatitis (old) 2</p> <p>Acute parenchymatous degeneration 2</p>
<p>¹ Double in one case; death under either.</p>					<p>² Death in one case following explorative incision.</p>

NOTE.—In a case of nephrotomy death was due to chronic interstitial nephritis. Among the fatal cases of supra-vaginal amputation one death was due to cardiac failure before operation, one to cerebral embolism (?), two to chronic interstitial nephritis.