ANALYSIS OF COMMON CAUSES OF DEATH FOLLOWING PELVIC AND ABDOMINAL OPERATIONS.

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I HAVE selected this subject, not because I have had a high mortality, but for the reason that it is one of great interest to us all. It is the exception that I witness a death in my own work, and I am not prompted to write this paper because I am interested in post-mortem examinations; I never see them; but for the reason that I hear and read, in the great medical and lay press, of deaths which I think should not occur. My friends and acquaintances detail deaths and experiences in abdominal surgery, and ask me how they could have avoided the numerous accidents and deaths? They tell me that they think they can do better work the next time.

Just a year ago, after a heated discussion on drainage, I received a letter from a good friend who witnessed, on his way home from our last meeting, a section in a greatly emaciated patient, for an old suppuration, with extensive adhesions and bowel lesions. The operation was finished, an open treatment, and shortly after his return home he writes me as follows: "Since my visit with you I have done six successful, but desperate, cases with the open treatment. I really believe they would have all died had I not left in a great duct and packing." This is an expression from a good surgeon with long and varied experience, both in his own hands and in observation of the work of others. You often hear good men say "nothing succeeds like success," and I believe it stimulates many to do painstaking work. It is

well that operators should have over them what the boy gives the top—the lash. The dread of a death, the criticisms or comment of colleagues or hospital directors should not stay his hand in the wise choice of material and the completion of operations that should not be abandoned, nor incompleted.

A prominent young operator remarked to his assistant "that they had had too many deaths; that the Directors were talking;" and finished his operation as exploratory in character.

Mr. Tait in his first series of one thousand sections had one hundred exploratory incisions, that is, one in ten; if we could exclude so large a percentage, by an accurate diagnosis, our mortality should be *nil*. Now, that we have hospitals in nearly every small village, we have a higher mortality than we ever had in the history of the speciality of abdominal surgery. The local surgeon, in thousands of instances, without more than an object lesson or two at a distance in a post-graduate school, attempts a great variety of operations in the peritoneal cavity, and explains the disaster of his patient's death as due to the hopeless conditions and complications found within the abdominal or pelvic cavity. All of these conditions and procedures would have been perfectly simple to a well-trained man. Unfortunately the lay directors and managers of hospitals have every confidence in the newly appointed surgeon-in-chief to their hospital, and yet the only knowledge they have of his surgical work is the amputation of Pat Maloney's leg some years in the past. They place their wives and daughters in the Templars, Odd Fellows or Red Mens' private room, or that furnished by the Presbyterian or Episcopal Church, or that endowed by $300 in perpetuity in memory of Mrs. Brown; and she dies on the third day, "Because the conditions were *simple* but hopeless."

I have written several papers on post-operative complications and several upon repeated operations in incomplete abdominal procedures. This is the class of cases that perplex me more and more as I grow older and give me the only mortality I meet with nowadays. Only recently I have had a number of trying and sad experiences.

In one case, a patient came from a prominent hospital after a very simple but incomplete operation, where the operator had only partially removed one pathological ovary and tube, leaving the organs on the other side in a badly diseased state. She was sent to me some four months following this incomplete procedure, emaciated, septic and suffering acutely. I opened the abdomen

a low mortality, taking cases as they come? I replied, "no, too high." After adopting the gloves, he reduced his death rate to about *nil*; but his precautions were all redoubled; for example, after operating on a septic case, other operations were postponed for thirty-six to forty-eight hours. Again, in a study of the complications and pathology, in his reported cases, I failed to find one which could have died from good surgery. Let me illustrate how difficult it is for the general practitioner to make choice of an easy operation. Recently a very good diagnostician asked me to incise a suppurating kidney, as he felt it was one of the most difficult and dangerous operations in surgery. I did it for him, and it was simple play when compared with much of the work I am requested to do. After the operation he desired me to see a patient with advanced pelvic suppuration on both sides, puriform tubes and ovaries, with extensive adhesions. This case, he thought, was an easy one and desired to perform the section. He operated and she lived only sixteen hours; my patient made a speedy recovery.

I operate in a great many small hospitals throughout the country, and I strongly advise my pupils and friends not to undertake complicated and unpromising operations, but to allow the older and more prominent operators do them. I could clip from the daily papers the accounts of deaths, both early and remote, which should never have occurred. While glancing over this morning's paper, I saw the notice of a death—a young man, twenty-two years old, who "never fully recovered from the effects of an operation, in May last, for appendicitis, and for several days his condition was critical." Re-operation by one familiar with such procedures would probably have saved him; his appendix or possibly a sponge remained in his peritoneal cavity. The adherent omentum and bowel were never freed, the snarls forming an obstruction from the effects of which he could have died at any time, or a puddle of pus in his pelvis or posterior to the cecum remained undrained. For a long while we discussed the propriety of operative intervention in appendicitis; now, we are discussing how to do it well without a death, and we are all shocked at the numerous incomplete methods of operating which are responsible for a high death rate all over the country. Some operators tell us that their acute septic peritoneal cases all die; in these patients his operation, his toilet and his drainage are all at fault.

Recently a brilliant young surgeon assisted me in an operation for acute gangrenous and perforated appendicitis, with general

septic peritonitis, the peritoneum charged and bathed in septic fluid. This case got a wash toilet and a coffer-dam drain; she never had a bad symptom. He remarked that about all these cases died in his hands. I see that in a splendidly appointed hospital, with which he is connected, the mortality is high in appendicitis operations. My reasons for alluding so fully to this subject are that the disease is so common, and the death rate so high.

Some years ago I alluded in papers and discussions, to appendicitis simulating typhoid fever with perforation, and stated that a good number of cases of appendicitis were being treated for typhoid. Some good clinicians and diagnosticians ridiculed the idea, and I am now almost sorry I ever presented the subject, as it seems that surgeons are going to the other extreme. In mild and simple typhoid, they are opening the abdomen and removing the appendix with unfortunate sequelæ and a startling mortality. This reference is made purely to demonstrate a common error for a high death rate in abdominal surgery.

Vaginal incisions and perforations favor a high mortality in later operations made for the clean removal of the remaining pelvic pathology. Purifom tubes and ovaries, suppurating tubes and ectopic pregnancy, seldom allow sufficient improvement in vital force and stamina to bear well the complete operation (suprapubic) after they have been incised through the vagina. Primarily, they would all have been easy by complete methods without mortality. The choice of method and material are of paramount importance to good work, and the suprapubic procedures, when complete and done early, drainage used when necessary, should like the infrapubic, when done by one of the finished operators like Jacobs, Segond or Pryor, give a mortality close to *nil*. I do a large number of vaginal hysterectomies for malignancy of the uterus, cervix or fundus and for small fibroids without a death, and it is one of the easiest operations I am asked to do. In suppurative forms of tubal and ovarian disease I do not consider the vaginal route complete surgery; the adherent omental and bowel adhesions and the diseased appendix are wholly neglected. The anesthesia I consider of the first importance and have little choice between ether and chloroform. In the South, with a good anesthetist, I like to employ chloroform; while at home, anesthetizers know little about chloroform, but use ether well. Recently in Winchester, Va., I had two clinics, five or six cases in each, for appendicitis, hernia, cystoma, hysterectomies and gall-stones; these patients were produced rapidly

wise he employed the method of the essayist in preparing chromicized and ordinary catgut.

Dr. Albert Goldspohn, of Chicago, said that when the essayist spoke of imperfect surgical work in a general way it was most commendable; but when he included in this the drainage of abscesses which opened into the vagina, that any man almost would open, just as he would open a phlegmonous abscess, then he was mistaken. These cases certainly occurred to every operator of experience, and he thought Dr. Price would not operate on the profoundly septic, neglected, rotten cases that all operators sometimes got—cases that had a high temperature for many weeks, and a pulse of 150, sometimes not perceptible. Such patients, if subjected to a radical and complete operation, would invariably die. One could drain in these cases with little or no anesthesia; improve the condition of the patients, and later they became able to stand a thorough procedure.

As to sterilization of the hands and the use of rubber gloves, there was a large individual difference in men's hands. Some men were obliged to use rubber gloves, others were not. The surgeon who was careful with his finger-nails and took every precaution would not need this artificial protection in many instances. But every operator should wear gloves in doing dirty work. He could not keep his hands clean otherwise. This matter had been definitely settled by a long series of scientific and bacteriological investigations.

Dr. Robert T. Morris, of New York, N. Y., spoke of the use of rubber gloves, saying that it was a question that needed elaborate analysis. It was not to be dismissed in a few words by anyone. At the Hospital for Ruptured and Crippled, New York, the statistics of hernia operations showed that suppuration had been reduced from 4½ per cent. to 1½ per cent. under the use of rubber gloves. The record was carefully made, and it could not be denied. But this was in a special class of cases—hernia cases. Everything was in sight, and the surgeon could operate on most of these with boxing gloves. When one entered the peritoneal cavity and began to separate adhesions, he had another question to deal with. The two classes of cases should be separated as one would separate the sheep from the goats, and if attempts were made to separate peritoneal adhesions with rubber gloves the operator would tear things that he ought not to tear. He would leave wounds open so that more bacteria would gain access to the parts than were carried in on his hands. It was a mechanical impossibility for any man to do even fairly good work in abdominal surgery in cases of adhesions with rubber gloves on. Infection occurred not from the presence of one bacterium or two, but it was a question of dose. Bacteria carried in on the hands of the surgeon were in different degrees of proliferation. A man whose hands were moist habitually carried actively proliferating colonies of bacteria in the epithelium. The man whose hands were habitually dry carried bacteria always in the epithe-

lium of his hands; but the bacteria were not proliferating so rapidly. The bacteria from the hands of a dry-skinned man were not as dangerous as those of a moist-fingered hand.

A man with strong cell resistance killed or held in check bacteria in the epithelium of his fingers. A man with lesser normal cell resistance allowed bacteria to proliferate with a greater degree of rapidity in the epithelium of his fingers. Therefore, the surgeon with strong, natural cell resistance, holding in check bacteria in his fingers so well that they were not in an active stage of proliferation, was not going to infect a patient who would be infected by the fingers of another man. The problem included the individual characteristics of the surgeon, his normal cell resistance, habitual moisture or dryness of the hands, etc.

DR. JAMES F. BALDWIN, of Columbus, Ohio, said there was one part of the paper which had not been touched upon, namely, that which referred to the large number of hospitals being organized in villages, and the frightful mortality that attended the operations which were performed in these hospitals. The trouble was in having staffs for these hospitals, and some man, as the essayist had said, who had amputated a man's leg a year or two before, perhaps, was the chief surgeon of the hospital. He was incompetent to do all of the surgery that was required of him, consequently the results were disastrous. He did not know that anything could be done unless the people were educated so as not to appoint staffs for these hospitals. There were one or two hospitals in Ohio in which any surgeon could operate. There was no staff. He visited Jacksonville, Ohio, a few weeks ago. They had two successful hospitals there, and they had no end of trouble when they had staffs. Now they had none. The hospitals were well supported. Every tub should stand on its own bottom. Any skilful surgeon could operate on anything that came along, and he had no doubt the mortality in these institutions was much lower than it used to be.

In regard to the use of rubber gloves, the great value consisted in their use in closing the abdominal incision, particularly where it was closed with animal sutures.

DR. CHARLES L. BONIFIELD, of Cincinnati, Ohio, said that however one might admire Dr. Price and his results, his productions should be read with a little doubt as to whether he was absolutely accurate. While it might be all right for Dr. Price in most of his cases of suppuration in the female pelvis to open the abdomen and do a radical operation, it was certainly not the wisest procedure for the average abdominal surgeon to undertake. It could not be denied that the average man would secure better results by draining his cases primarily that were easily drained, but not those where by so doing there was great liability to tear the bladder or bowel, but where a pus tube was grafted behind the uterus, one ought to be able to open an abscess there just as readily as he would open a boil. These cases should be drained and later operated on in a radical manner.

As to catgut ligatures, those who had been using catgut for a number of years had so little trouble with it that they would be loth to return to silk, for if silk was introduced in a perfectly aseptic way, trouble might result from it.

Relative to the use of rubber gloves, any man could operate with more dexterity without them than with them. Nearly all germs that gained access to a wound were carried there by the surgeon's hands, or by the materials used in the operation. One of the great advantages of rubber gloves was the readiness with which they could be cleaned. In separating adhesions and opening abscesses the hand became contaminated, and it took a good deal of time to sterilize it again. It was impossible to do it in the progress of the operation. The rubber glove was smooth, and could be cleansed almost immediately. A German, whose name the speaker could not recall, conducted a series of experiments last year along this line, and stated that gloves could be rendered sterile by washing them with soap and water.

Dr. John Young Brown, of St. Louis, Mo.. said that at the last meeting of the Mississippi Valley Medical Association he reported 19 cases in which vaginal section for drainage was resorted to for pus. Five of these were subsequently operated upon. Abdominal section was done in four of them. One of the patients was taken ill five months after vaginal section, while at Atlantic City, and was subsequently operated upon by Dr. Joseph Price, who did an abdominal section. The speaker was reasonably confident that none of these patients would ever have come to abdominal section if they had not been drained through the vagina primarily. The cases operated upon were all desperately ill, and while he had seen Dr. Price operate on these cases through the abdomen, he had not had the boldness to do it himself. In the case (Price) subsequently operated upon, the appendix was bound down with adhesions from sigmoid to cecum. He received a letter from Dr. Price after this operation calling him to task for having resorted to vaginal section primarily. He believed that had he not operated through the vagina Dr. Price would not have operated on the woman through the abdomen subsequently.

He agreed with Dr. Morris that in separating adhesions it was impossible to do so as well with the gloves on as it was without them. He had tried time and again to work in the abdomen with gloves, but confessed that he had not been able to do as good work with them as without them. In his own work, however, the number of cases of stitch-hole abscesses, infection of wounds, etc., had been largely reduced by the use of the gloves in appropriate cases.

Dr. Edwin Ricketts, of Cincinnati, Ohio, referred to ligatures, saying that notwithstanding the remarks of Dr. Hayd and others, the tendency of operators to-day was to use pure silk. No less an authority than Hans Kehr used silk from beginning to end in closing his incisions in cases of cholecystectomy, etc.

Dr. J. Henry Carstens, of Detroit, Mich., could not agree

protect the cavity that was left where one had to peel off a pus tube.

Dr. Price, in closing the discussion, said that some years ago the surgical work at the Hospital for Ruptured and Crippled, New York, was done in the afternoon. Many of the operations were performed by resident physicians, but things had changed. At the present time operations were done early in the morning. The operative work was done after baths and douches and a small breakfast. In their mortality statistics the fact was lost sight of that they did their work earlier now than formerly, before contamination took place, and the reduction in mortality was not wholly due to the use of rubber gloves, because the mortality rate was lower the world over.

At the Samaritan Hospital years ago Bantock operated in the mornings, with a mortality of only one or two per cent., while Knowsley, Thornton and others operated on patients at three p. m., with a mortality of 9.11 per cent. Martin and other German operators took a bath, a cup of coffee, and a roll, and operated in the morning, with almost *a nil* mortality. All the afternoon operators did their surgical work with a high mortality. The late Mr. Tait operated at an early hour, with a mortality of 3.5, and at 2 p. m. with a mortality of 8.5. He said if the members wished to lower their mortality, they should operate in the morning, while they were clean and their mental condition was the best, and before they prolonged the anxiety of their patients.