

## TOTAL VERSUS SUBTOTAL ABDOMINAL HYSTERECTOMY IN BENIGN UTERINE DISEASE\*

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**F**IVE years ago I presented before this Society my simplified technique for total removal of the uterus by the abdominal route and discussed the indications for the use of this more radical operation as distinguished from subtotal or supravaginal hysterectomy. At that time I expressed emphatic opposition to the routine employment of total hysterectomy in all cases and stated that it should be resorted to only when operable malignant disease of the body of the uterus is encountered or when, in addition to benign disease of the corpus requiring hysterectomy, it can be clearly demonstrated that menacing pathology of a benign nature coexists in the cervix.

It is generally understood, of course, that for a number of years this has been and still is a controversial subject and that the conservative opinion just expressed is by no means subscribed to by all those who have participated in the discussions. On the contrary, the multiplying reports within recent years of a surprisingly large number of cervical stump cancers has been largely responsible for the adoption by some eminent surgeons of routine total hysterectomy. And these same reports, I am frank to confess, unsettled my own convictions a bit and stimulated me to undertake a comprehensive review of the literature in order to evaluate impartially the accumulated factual as well as the inferential data pertinent to this controversy. It is my purpose to present here only a brief synopsis of this study in hopes that it may prove helpful in bringing about greater unanimity both of surgical teaching and practice as regards the preferential operative treatment of benign uterine maladies.

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Perhaps the most cogent argument offered in support of their contention by the advocates of routine total hysterectomy is the apparent steadily mounting incidence of cervical stump cancer. Judging from my own observations alone, extending now over a period of twenty-five years of active clinic work and private practice, I would unhesitatingly conclude that the occurrence of stump cancer is so rare as to be a negligible factor in this discussion. Consequently, great indeed was my surprise to learn from a recent publication by von Graff that he had been able to assemble nearly 1200 cases, two-thirds of which have been reported within the last twelve years. Certainly, therefore, cancer of the cervical stump can no longer be considered a rarity. Unfortunately, it is impossible to determine with any degree of accuracy its absolute incidence because no one has the remotest idea how many thousand subtotal hysterectomies have been performed the world over to produce 1200 instances of stump cancer. Nor, on the other hand, is it at all probable that this number represents the total incidence, since scattered cases have been observed here and there which have never been reported. The average incidence subsequent to approximately 10,000 subtotal hysterectomies reported by a dozen different authors is a little less than 1 per cent. But in a study at the Johns Hopkins Clinic just completed and not yet published Erle Henriksen found among 940 cases of cancer of the cervix an incidence of 2.3 per cent of stump cancer. In some other statistical reports of the same kind this percentage is considerably higher, the average being around 4 per cent. Curiously enough, in the literature on cervical stump cancer both from American and European sources one repeatedly encounters the testimony of men who for years have been either at the head of or closely identified with large and active gynecological clinics that they have never seen a single case of stump cancer. Such wide statistical variations are to be explained probably by the fact that within recent years most of the cervical cancer cases have been referred for treatment only to institutions which are adequately

equipped for irradiation therapy. All factors considered, I do not believe that the actual incidence of stump cancer the world over today exceeds 3 per cent.

In this connection it is important to consider the time interval between the performance of subtotal hysterectomy and the subsequent appearance of stump cancer. Most writers upon the subject have arbitrarily assumed that all cancers becoming manifest within one year were present and overlooked at the time of the operation. Now over 20 per cent of the cases fall into this category. The remainder, constituting more than three-fourths of the total incidence, have developed after periods of from one to twenty years and all of these, according to the claims of its advocates, would have been saved by routine total hysterectomy. Obviously this assertion is entirely unwarranted, since not only does it inaccurately assume that the more radical operation as performed by the average surgeon carries with it no mortality whatsoever, but also it utterly ignores authentic reports of a score or more of vaginal vault cancers which developed subsequent to total hysterectomy, thus proving conclusively that even this procedure does not afford absolute protection.

But the major fallacy in the argument of those who contend that the present incidence of stump cancer is itself reason sufficient for the universal adoption of routine total hysterectomy is the significant fact that absolutely no data are available for determining the condition at the time of the original operation of those cervixes in which cancer later developed. It is pretty safe to assume that most of them occurred in cervixes which at the time of the subtotal hysterectomy presented the familiar picture of old lacerations, hypertrophy, so-called erosion and chronic infection. Certainly it would be very easy to build up convincing circumstantial evidence in support of this assumption. And if this be true, the incidence of stump cancer should be construed not as a compelling reason for the universal adoption of routine total hysterectomy, but rather as an index of the unfortunate

choice of cases suitable for subtotal hysterectomy. This latter operation is properly applicable to only four types of cases: (1) to those women requiring hysterectomy for benign disease who possess perfectly normal cervixes; (2) to cases where the operative hazard compels the execution of rapid and conservative surgery; (3) to a few cases where for good and sufficient reason it is of paramount importance to preserve the function of menstruation; and (4) to most cases requiring hysterectomy during pregnancy. Before deciding upon subtotal hysterectomy, therefore, it is incumbent upon the surgeon to scrutinize the cervix with particular care, making use not only of intelligent palpation and accurate inspection of it but also utilizing freely such diagnostic aids as the colposcope, the Schiller test, biopsy and diagnostic curettage. Furthermore, remembering how frequently coexisting carcinoma at and above the level of the internal os is overlooked, the body of the uterus immediately upon its removal by subtotal hysterectomy should be laid wide open so as to permit accurate inspection of every centimeter of the endometrium; likewise all fibroid tumors should be bisected and carefully examined and an immediate frozen section report should be obtained from any suspicious areas. There is scant likelihood that stump cancer will later develop in any cervix which survives the rigid application of these tests.

Much has been written concerning the predisposing influence upon the development of cancer of the uterus which appears to reside in fibroid tumors. Of course it has long been known that with at least 3 per cent of all fibroid tumors there coexists malignant disease in the form of adenocarcinoma of the uterine cavity, sarcomatous degeneration of the fibroid tumors themselves or cancer of the cervix. But recent statistical studies of uterine cancer reveal the striking fact that cancer of the body occurs nine times and cancer of the cervix four times oftener in association with fibroid tumors than is the incidence in otherwise normal uteri. Moreover, fully two-thirds of the cases of stump cancer thus far reported have

followed subtotal hysterectomy for fibroid tumors. Here it should be recalled that there is uniformly associated with fibroid tumors a marked grade of hypertrophy and hyperplasia of the endometrium and that according to some pathologists, the squamous epithelium of the cervix exhibits similar signs of growth activity. Evidence is accumulating which shows an enormous concentration of the ovarian hormone folliculin in fibroid tumors, a fact which strongly supports the speculative assumption that such colossal cell proliferation as is exemplified in a rapidly growing fibroid tumor, and contemporaneously both in the hyperplasia of the endometrium and possibly also in the squamous cells covering the portio vaginalis, must be the direct result of sustained and powerful stimulation of a growth hormone. Whether or not such dysfunctional hormonal influence is responsible for an epithelial transition particularly favorable to the later development of cancer is but one of a number of related problems that await solution through the energetic and untiring efforts of our esteemed research colleagues.

The practice of coring out the mucous membrane of the cervical canal at the time of subtotal hysterectomy or destruction of it by heat applied in one form or another has been emphasized by some surgeons and adopted by a considerable number as a reliable safeguard against the subsequent development of stump cancer. But when it is recalled that more than 80 per cent of all cancers of the cervix originate from the squamous epithelium of the portio vaginalis it becomes evident that this procedure has only a meagre prophylactic value. On the other hand, the majority of stump cancers appearing within one year after subtotal hysterectomy are adenocarcinomas, and since these are assumed to coexist at the time of the operation, it becomes evident that the block of cored out cervical tissue possesses particular value for immediate biopsy by the frozen section technique.

Two other points of practical importance appear to have been established through statistical studies which need to be

emphasized because they are in conflict with prevailing surgical opinion: (1) that approximately 10 per cent of these stump cancers occur in women from twenty to thirty-five years of age; and (2) that over 20 per cent of these women have never been pregnant.

The latter point serves to focus our attention sharply upon the possible rôle which chronic infections of the cervix play in the etiology of cancer, since a considerable proportion of stump cancers follow subtotal hysterectomies performed because of the late consequences of uterine and adnexal infections. Furthermore, it has been abundantly demonstrated that such infected cervixes are etiologically responsible for at least a small proportion of the cases of infectious arthritis. Chronic leucorrhœa, which is so prevalent as to be accorded but scant consideration by the average doctor, is the sign that points unmistakably to the existence of these lurking menaces. Consequently, the teaching of those who emphatically condemn subtotal hysterectomy in the presence of chronic infection of the cervix is unquestionably sound.

Conspicuous in all of the discussions upon the universal adoption of routine total as distinguished from elective total hysterectomy has been the question of relative mortality. Unfortunately, on this phase of the subject statistics prove their own unreliability. Where they represent the operative results of highly trained, experienced and skilful surgeons the percentage difference in mortality between the two operations is so small as to represent only the accidents common to all branches of major surgery. In such hands the mortality in either group does not exceed 1.5 per cent. But according to the statistics of Fullerton and Faulkner based on 1851 consecutive hysterectomies, where the figures apply to the average run of an active clinic in which the routine operating over a period of years has been participated in by a score or more of individuals, including senior residents who have not yet completed their apprenticeships, the gross mortality in both types of hysterectomy is 4 to 4.5 per cent. Note, however,

that in 63 per cent of 1078 total hysterectomies performed by five members of the visiting staff the mortality was 3.5 per cent; while in 37 per cent performed by twenty members of the resident staff the mortality was 5.2 per cent. These figures indicate pretty clearly what would happen if inexperienced pelvic surgeons everywhere undertook the routine performance of total hysterectomy.

Furthermore, comparison of mortality statistics alone by no means tells the whole story. Certainly consideration of postoperative complications and of morbidity should not be omitted when one undertakes to evaluate the relative merits of two operative procedures. Notwithstanding this fact, there is a striking and disquieting paucity of data in the literature relating to this vitally important phase of the subject. But from my own observation and experience I have no hesitancy in asserting that if such specific tests as the incidence of operative and postoperative hemorrhage, surgical shock, damage to bladder, ureters and rectum with consequent fistula formation, postoperative cystitis, pelvic cellulitis, peritonitis, intestinal obstruction, wound infections, phlebitis, thrombosis and embolism, pneumonia, sustained daily elevation of temperature above  $100^{\circ}$  and total duration of convalescence were rigidly applied, it would be exceedingly difficult to justify the advocacy of universal routine total hysterectomy. Unquestionably this is a surgical procedure of far greater magnitude requiring larger experience and more highly developed technical skill for its successful application than does subtotal hysterectomy.

A discussion of vaginal hysterectomy does not come within the scope of this paper and I refer to it only in order to emphasize the fact that in properly selected cases it possesses distinct advantages over both total and subtotal hysterectomy performed by the abdominal route.

From what has been said it is apparent that the advocates of routine total hysterectomy offer three arguments in support of their contention; (1) the present incidence of stump cancer;

(2) the prevalence of focal infections in the cervix; and (3) the assertion that the difference in mortality between total and subtotal hysterectomy is so slight as to be a negligible factor.

Opposing conservative opinion, on the other hand, contends that the incidence of stump cancer should be interpreted merely as an index of the ill-advised use of subtotal hysterectomy, since one cannot discover in the recorded data any evidence that normal cervixes later become cancerous; (2) that in the hands of the average surgeon total hysterectomy is unquestionably a more hazardous undertaking and is attended by a substantially higher mortality than is the subtotal operation, and (3) that likewise panhysterectomy involves far greater risk of serious operative and postoperative complications, as well as a longer period of morbidity, than does the supracervical technique.

Finally, no one can review the voluminous literature on this subject without being profoundly impressed by the continued reprehensible prevalence of benign diseases of the uterine cervix and their etiological relationship to cancer. Because of this fact it is exceptional to encounter a normal cervix in conjunction with the indications for hysterectomy. Consequently, despite its many advantages, conservative subtotal hysterectomy has today only a limited field of application. And recognition of this situation coupled with unsatisfactory experiences in connection with the older operations led me to develop a simplified technique for abdominal panhysterectomy designed specifically to guard against the major hazards incident to this procedure, namely, mortality, hemorrhage, shock, damage to ureters, bladder and rectum and postoperative peritonitis. Thus far in my own series, which as yet totals not quite 100 cases but which embraces every variety of both simple and complicated pathology requiring this type of surgical therapy, none of these hazards has materialized. Therefore, I can with great confidence heartily recommend this simplified technique to other surgeons who, like myself, have found the older operations formidable and unsatisfactory.



## DISCUSSION ON PAPERS OF DRS. SHALLENBERGER AND RICHARDSON

DR. F. WEBB GRIFFITH, Asheville, N. C.: Two years ago, before this Association, I reported the results of 693 hysterectomies done by me personally for benign conditions of the uterus. There were 14 deaths, a trifle over 2 per cent. In that series, all the deaths were after the subtotal operation. At first glance, it would appear from that that the subtotal is the more dangerous. I think it was Mark Twain who said that he considered the bed a most dangerous place, because so many of his friends died there. I feel that frequently our deductions are similar to those of Mark Twain. The explanation, of course, is simply that the poor risks were operated upon by the subtotal method. There is no doubt that in the hands of the average surgeon the supravaginal operation is by far the safer. If you take 1000 patients and do a subtotal hysterectomy on every one, and add to your mortality the deaths from cancer later developing in the cervix left behind, you will still have a much lower death rate than if all the thousand had been subjected to a total hysterectomy. In my series, most of which were subtotal, so far as I know only one patient subsequently developed a cancer of the cervix. Had there been any others, I think I would have known it from my work comes from a relatively small territory.

There is one other procedure that I think we might use in selected cases. For example, in a fat woman, where the pelvic organs are pretty well bound down, and where the cervix is lacerated and covered with a leucorrhœal discharge, it is reasonably sure that a total hysterectomy would be quite difficult. In such a case, we are justified in doing a high amputation of the vaginal portion of the cervix, and then going into the abdomen and doing a subtotal hysterectomy, thoroughly cupping the remaining small segment of the cervix. That double procedure can be done with relative safety and in less time than the average total hysterectomy. In that way, all of the epithelium of the cervix, both columnar and squamous, has been removed and the danger of cancer eliminated.

DR. THOMAS S. CULLEN, Baltimore, Md.: While Dr. Shallenberger was talking, I was reminded of an experience I had on a trip to Western Maryland. The hospital was close to the station and as soon as the train was heard approaching the anesthetist started the anesthetic and I had no opportunity to talk to the patient who entered the hospital to be operated on for a myoma which occupied the left side of the cervix and filled the greater part of the vagina.

On making a pelvic examination, in addition to the cervical myoma, I found an enlargement in the lower abdomen and at once said that the

patient was either pregnant or had an ovarian cyst. The family physician said that there had been no signs of pregnancy and that the patient had missed no period.

On opening the abdomen a four months' pregnancy was found. It might have been wiser to have closed the abdomen and waited until the pregnancy had advanced to term, but as the abdomen was open we went ahead, took out the cervical myoma and about one-third of the vaginal mucosa, brought the vaginal edges together and closed the broad ligament.

The patient went on to term and was delivered of a 10 pound child.\*

On December 14, 1923, I saw a young woman who was five months pregnant and who had a ruptured appendix and a pelvic peritonitis. I at once removed the appendix, wiped out the pelvis, and placed two drains, one in the pelvis and one up toward the right renal pocket.

A few hours after operation the patient had labor pains. She miscarried the same night.

After operation her temperature remained normal but her pulse was a little rapid.

On December 23, her leucocyte count was 28,000 and she had a little vomiting, fecal in character. Her stomach was washed out and she was given an enema. A rather large loop of small bowel could be seen in the left lower abdomen.

I made a left gridiron incision and at once encountered free fluid. Three loops of small bowel directly behind the uterus had stuck fast to the promontory of the sacrum. We loosened these and the distended bowel at once grew smaller.

As a safeguard, a loop of small bowel was brought up into the incision to be opened later if required. This was, however, not necessary. The next day the patient's bowels were moved by enema.

The patient continued to have a fever, sometimes reaching as high as 103°F., and there was a definite thickening in the left side of the pelvis. This was opened on January 5, 1924, and about 50 c.c. of non-offensive, grayish yellow pus escaped. Two drains were introduced.

The patient made a slow but satisfactory recovery.

As she was very anxious to have children, I did a Rubin test from time to time and finally she became pregnant. She is now perfectly well and has two children.

I was much interested in the admirable and judicial manner in which Dr. Richardson handled the subject of subtotal versus complete hysterectomy for myomata.

In 1909 Dr. Howard A. Kelly and I in "Myomata of the Uterus" reported the results of a careful analysis of nearly 1700 cases operated

\* The case is reported in full in Kelly and Cullen: *Myomata of the Uterus*, p. 532.

upon by us and by our colleagues. In this book we described in detail those cases where carcinoma of the cervix or body of the uterus was present at the time of operation, and also those cases where sarcoma was found developing in the myomata. We pointed out that in many cases the entire uterus could not be removed because of the dense inflammatory condition. After considering the subject from every angle, we came to the definite conclusion that taken all in all the supravaginal hysteromyomectomy yielded the best results, and I still feel that more patients can be saved by this method. Of course in those cases where at the time of operation the cervix is suspicious looking, then complete removal of the uterus is clearly indicated.

DR. H. J. BOLDT, White Plains, N. Y.: I propose principally to add verification to what Dr. Shallenberger has said with regard to pregnancy connected with myoma. Very many years ago a woman came to my office with labor pains. Upon examination I found that she was pregnant, between the third and fourth month, with an interstitial myoma as a complication. I did a myomectomy on her for the purpose of saving the child. She went to term with her baby.

With regard to Dr. Richardson's paper, I will say this: Whenever I found a pathologic condition of the cervix I did a hysterectomy; whenever I found a non-pathologic condition I did a supravaginal hysterectomy, because it was quicker, although I do not think I had any difference in mortality between subtotal and complete. I recall but one instance of a cancer developing after a stump was left in the uterus.

DR. JOHN S. McEWAN, Orlando, Fla.: Since hearing Dr. Richardson's paper five years ago I have been following his technique in hysterectomy, and have been paying attention to the cervix. Our rule is to carefully inspect the cervix, and if it is apparently normal—no erosions, no ulcerations and no discharge—we do the subtotal hysterectomy. If it is not an emergency and the patient has a discharge we try to cure that before we do a complete hysterectomy. We have a large number of fibroids in the South among the colored people. I do not know how many we have operated upon, but a large number. When you get a fibroid in the negress with a couple of pus tubes, infections of the sigmoid and some other things, you do not do hysterectomy. I think the high mortality today in total hysterectomies is due to the operators. In traveling about this country and others I find a great difference in technique, and many of the complications come from men who are not careful in their work. They either operate too fast or do not know what they are doing. It is not necessary to have these complications. I have never seen a fistula following a total hysterectomy and believe that with ordinary care and a good technique one will not have them.

I think a complete hysterectomy is not indicated as a routine measure.

DR. WILLIAM T. BLACK, Memphis, Tenn.: I agree fully with what Dr. Richardson said regarding hysterectomies. In the Memphis General Hospital we run about four large fibroids a week, and we teach that the supravaginal hysterectomy is the operation of choice, for 90 per cent of these cases are complicated by inflammatory disease. In private work where conditions are different I more often perform complete hysterectomies. I think we should study the cervix before operating in an effort to determine whether or not the complete operation is indicated over the subtotal. Three lives out of every 100 will be saved, where less skillful surgeons operate, when the supravaginal hysterectomy is performed.

Discussing Dr. Shallenberger's paper: In the past two months have had two ovarian tumors complicating pregnancy. One was a twisted ovarian cyst the size of a grapefruit occurring in a patient six weeks pregnant. The corpus luteum of pregnancy was present in the ovary accompanying the cyst. In four or five days the patient aborted. Corpus luteum was given freely with the idea that the progestin might continue to act as it does during the menstrual cycle, by further keeping the decidua sensitized and helping in the continued nidation of the impregnation. Of course, one must consider that the progestin, which has this hormone effect, continues to be antagonized by oestrin, which is also developed from the corpus luteum. If progestin were available, many of these abortions could probably be prevented.

The second case was a dermoid cyst about the size of a six or seven months' pregnancy, which complicated a three months' pregnancy. The type of cyst was diagnosed preoperatively by x-ray. It is strange that the corpus luteum of pregnancy was also in the ovary in which the cyst was found. This patient did not abort, due to the fact that the placenta was able to carry on after removal of the corpus luteum of pregnancy.

These 2 cases are good examples demonstrating the stage in which the corpus luteum of pregnancy is essential, and the second case demonstrating that the function has been taken on by the placenta.

DR. JAMES F. PERCY, Los Angeles, Calif.: I wish to speak concerning Dr. Richardson's paper. Just before coming to this meeting I operated, by my cautery technique, on a very extensive carcinoma of the cervix in a woman who had a subtotal hysterectomy twenty-three years before. It was for some non-malignant condition. I furnished 16 of the cases reported by von Graff, from whose paper Dr. Richardson has quoted, and in addition, found several more in my files. Postoperative carcinoma of the cervix following subtotal hysterectomy, therefore, is not an uncommon sequel in my experience, although I have no other record of this condition coming on twenty-three years later following partial removal of primarily

a non-malignant uterus. The women that I see with this condition rarely give a history of less than three years at the earliest before the characteristic symptoms of cervical carcinoma appear following the hysterectomy.

We all know that the vault of the vagina following a subtotal hysterectomy for fibroids is much more normal than it is following a panhysterectomy for cancer. The dangers of a subsequent carcinoma developing in a cervix after a subtotal hysterectomy can almost certainly be prevented if the cervical canal is thoroughly burned out from above with the actual cautery. This was advocated in a worthwhile article some fifteen or more years ago by a Southern surgeon whose name I have not been able to find for this discussion. It should then be emphasized that carcinoma of the cervix, following subtotal removal of the uterus, is much more common than we have heretofore realized, and we most earnestly advise the thorough cauterization of the cervical canal with the actual cautery (not diathermy) following the removal of the uterus.

DR. W. F. SHALLENBERGER (*Closing*): Some years ago I was called upon to testify in Court for the late Dr. Bert Wagnon, of Atlanta. He had operated upon a woman because of fibroid tumors. The patient had misled him in her history and was pregnant at the time of the operation but Dr. Wagnon did not suspect this and did not recognize the pregnancy until the time of the operation. He removed the fibroid tumors and the patient, after a fairly stormy convalescence, went to term and was delivered by another doctor. However, she brought suit against Dr. Wagnon.

When I was on the stand the attorney for the plaintiff said to me, "Is it not true that no operation should ever be done during pregnancy unless there is a good and sufficient reason?" I replied that "No operation should ever be done at any time unless there is a good and sufficient reason." He flared back with the statement "That isn't what I asked you. I mean should it not be a matter of life and death before any operation is done during pregnancy," and to this I replied that we should not wait until it is a matter of life and death before operating, and that is the attitude I wish to take regarding operations during pregnancy; namely, never operate unless there is a good and sufficient reason and do not wait until it is a matter of life and death.