Carcinoma of the Cervix—The Wertheim Operation

Joe Vincent Meigs, M.D.

This paper represents the personal experience of the author in the radical surgical treatment of cancer of the cervix of the uterus. It is not a plea to others to undertake such surgery. Frank W. Lynch, Victor Bonney, and the (late) Fred J. Taussig have been used as guides as the work has progressed. Their enthusiasm and their well-done work were inspirations. Bonney’s results, so well known to all of us, were excellent but his mortality, even in his last two series of 100 cases, is too great. His mortality figures had to be bettered. This might be accomplished by a better selection of cases and perhaps by the use of improved preoperative and postoperative treatment. Lynch’s2 proof of the presence of apparently viable cancer cells in cervixes removed after radiation and his encouragement to the author while in San Francisco spurred on this surgical experience. Taussig’s4,5,6 careful and thorough dissection of the pelvic lymph nodes as an adjunct to radiation of the cervix and pelvic tissues, and the apparent ability to cure, at least for five years, some patients with positive lymph nodes led to a desire to see his work. The observation of his dissections while in St. Louis demonstrated that part of the surgical procedure. Taussig advises pelvic lymph node dissections in all group C patients treated by radium. The results in our clinics in 12 Taussig operations caused us to decide to try, not his operation, but a radical surgical procedure, in which a combined radical surgical removal of the uterus was attempted, and in addition his method of lymph node dissection was carried out.

It has been obvious to the author, after the observation of possibly 2,000 cases of cancer of the cervix, that radiation is not the ideal method of treatment. Radiation reactions are occasionally very severe and the morbidity caused by the treatment in a large group of patients is great and depressing. It is not common to find that in early cases patients fail to respond to treatment when it is obvious that if the patient had been operated upon, success might have followed. The larger the experience with radiation and the longer the follow-up of cases, the more discouraged our staff has become over our results. Patients with advanced cervical cancer occasionally do exceptionally well, and yet if in such a hospital as the Pondville Hospital (Massachusetts Department of Public Health) the absolute curability figures are considered, it is apparent that in only the early and favorable cases are patients cured. Of 1,000 patients of all groups and grades coming to that hospital only

Reprinted from Surgery, Gynecology & Obstetrics 78: 195-199, 1944.
100, or 10 percent, have survived five years. It should be mentioned here that many of the patients in Pondville had been radiated or operated upon before coming there. In the Massachusetts General Hospital, with the use of a similar form of treatment, the end-results for 395 patients who received treatment (and not including those who were not treated) show a five-year curability of 15.9 percent. Yet in a specially studied series of 70 patients at the Pondville Hospital treated by the combined method of X-ray and radium, and including all the patients that were treated, 34.3 percent survived five years. This is very confusing, but it is clear that certain small series of patients treated as a special group and therefore a selected group, will do better than a very large group as a whole. It is unfortunate to think that in special series selections of cases are made, but it does seem obvious from the figures given that that, plus the fact that the surgeon and roentgenologist are doing a piece of research work, makes a great deal of difference.

Five reasons have led to the introduction of an old and formidable operation into the treatment of cervical cancer in our clinics. These five reasons follow:

1. If the cervix has been removed, there is no chance for a recurrence in it.
2. If the cervix has been removed, no cervical cancer can re-grow in it as a recurrence.
3. Certain cancers of the cervix are radiation resistant—a fact proved at the Pondville Hospital, where multiple biopsies are performed at the time the X-ray and radium treatment are being carried out.
4. There will be less damage to the bowel if surgery is undertaken. Lately 46 cases of serious bowel injury have been found in our clinics.
5. From the work of both Bonney and Taussig it is obvious that patients with lymph node metastases can be cured by surgery in some instances and the author believes that it is not possible to cure with radiation cancer in lymph nodes deep in the pelvis.

Other reasons, such as bleeding, discharge, fistulas, radiation reactions, etc., could be cited against radiation but the five reasons here given are the real ones upon which this surgical work was predicated.

In answer to this the proponents of radiation will remark the seriousness of the surgical procedure and will call attention to the danger to the ureters and bladder. This matter will be discussed later, and it is of real consequence in a group of surgical patients.

The surgery must be limited to certain types of patients; ideally they should be thin, young, in good health and have an early growth. One would think that patients with such qualifications would be impossible to find but the number operated upon in our series is increasing each year and we have only occasionally stepped outside the bounds of the qualifications here enumerated.

One other group has been operated upon and will be discussed separately in the statistics and results. These are the patients in whom one or two radiation attempts at cure have failed. These cases are nonelective and are “must” cases and the results would be expected to be poor and they are. Yet one of our patients in this group has lived for two years and one month.

Material (Table 1.)

The elective material consists of a total of 47 cases—27 from the Pondville Hospital, 14 from the Massachusetts General Hospital, and six from the author’s private practice. In the nonelective group there were six cases—four from the Pondville Hospital, and two from the Massachusetts General Hospital. This surgical series was begun in 1939 and has continued to date. In the first year there were two patients
operated upon; in 1940, eight; in 1941, eight; in 1942, 19; and in 1943 (to July), 10. More patients to operate upon were found than expected.

Classification of Material

The material was classified into elective and nonelective cases and the two groups are considered separately. In the elective group according to the American College of Surgeons' classification, for such a small group the League of Nations' classification is too complicated, there were 34 Class A cases, nine Class B cases, and four Class C cases. The types and grades of malignancy were as follows:—adenocarcinoma, six; adeno- acanthoma, one; epidermoid cancer, grade I, four; epidermoid cancer, grade II, 13; epidermoid cancer, grade III, 20; and epidermoid cancer, grade IV, one. Cancer that could not be graded was found in two cases. The ages of the patients showed that five were from 20 to 29, 11 from 30 to 39, 21 from 40 to 49, nine from 50 to 59, and one was 68 years old. Most of the tumors were therefore early, most were rapidly growing cancers, and most were in patients who were less than 50 years of age. Complete statistical work on such a small series is of very little value.

Preparation and Care of the Patient

The preparation of the patient for operation is very important. This consists of admitting the patient to the hospital four to five days before the operation is to be done. The blood chemistry must be brought to normal, vitamins are supplied in large amounts to arrive as far as possible at a normal level, and blood transfusions are commonly given. Two days before operation the patient is started on one gram of sulfadiazine every four hours. The blood level has been determined in the beginning and is usually found at six to eight milligrams percent. Lately the sulfadiazine has been given without determination of the level. At operation four grams of sulfanilamide are placed in the large pelvic defect under the new peritoneal floor. Sulfadiazine is continued by mouth as soon as the patient can take it and is continued for seven days after operation. In the first years sulfanilamide was used and sulfapyridine followed that, but for two years sulfadiazine has been the chemical of choice. Knowing full well the possibilities of foreign body reactions caused by these drugs, sulfanilamide has been very carefully placed under the new peritoneal floor.

In some cases of the elective group X-ray and radium treatment were given before operation. Rarely, and yet very definitely occasionally, has radiation seemed to make the operation any more difficult; 40.4 percent of the patients had radiation treatment before operation. Some had radium alone, some but one-half the regular dosage of X-ray or radium or both, and 10 patients had the complete X-ray and radium cycle before operation. As experience is greater it is felt that either no radiation at all or one-half the usual X-ray radiation with no radium is the method of choice in preparation. A small amount of radiation to injure the tumor cells, and a very small amount will do so, is probably worthwhile. No figures are available to settle the question definitely.

The Operation

The operation is commenced by preparing the vagina by cleansing with dry gauze and washing out the vagina carefully with a double strength Schiller's solution. The bladder is catheterized and a self-retaining catheter left
in place because as the operation takes a considerable time it is well to have the bladder remain empty all the time. It was formerly thought necessary to catheterize the ureters but as ureteral fistulas were considered as possibly due to this maneuver it was abandoned. The catheter is stiff and the bared ureter is easily caught by gauze sponges and stretched. Also it was felt that when the ureter was gently picked up with forceps perhaps the pressure on the inside of the ureter against the catheter as well as on the outside of the ureter might have something to do with ureteral injury. Of the entire group, however, just as many fistulas have occurred in patients having no ureteral catheters used as in those with them, so no real advice can be given about this problem.

The incision is made from the symphysis to well above the umbilicus, for the dissection starts along the common iliac artery and the aortic bifurcation is usually above the umbilicus. The first step is to dissect the bladder peritoneum from the front of the uterus and to release the bladder as far down the vagina as possible, usually to the trigone. The infundibular pelvic ligaments are ligated, the catgut is left long, and a clamp is applied and brought over the edge of the wound. The round ligament is released and the catgut tie is clamped and also brought over the edge of the wound. The dissection is then carried down the common iliac artery on the right side to its bifurcation where a lymph node may be found. The external iliac vein is located and it and its artery are stripped of all fat and possible nodes. The muscular area lateral to the artery is cleaned off, thus exposing the iliohypogastric nerve. At the bifurcation of the internal and external iliac arteries the ureter is seen attached to the medial peritoneum; it is dissected free of the peritoneum down to the area where the uterine artery coming off the internal iliac artery crosses it. This deep angle of internal iliac artery, ureters, and uterine artery and vein is a difficult place to dissect, but it must be done carefully and completely because of the possibility of a ureteral node being present. The uterine artery is tied as it arises from the internal iliac and is pulled toward the uterus, thus exposing the ureter which passes under it and on into a definite groove or canal through which it goes on to the bladder. The release of the ureter is one of the most difficult parts of the operation for occasionally it is extremely adherent. It must be freed entirely or enough vagina cannot be removed, and yet to dissect it free means to use force and a certain amount of injury occurs; it is here that the author believes the ureter is injured and fistulas develop. The ureter is freed from this canal down to the entrance into the bladder; this area is not difficult to locate as the ureter flares out as it reaches the bladder. Next the obturator fossa (first demonstrated to the author by Dr. Taussig) must be cleaned out. It lies below the distal part of the external iliac vein and is easy to find. There is usually a large amount of fat in the fossa and it is an excellent place for lymph nodes to lurk. In five of our eight cases with positive lymph nodes the obturators were positive. The obturator nerve is found running like a banjo string across the fossa. In the depth of this fossa lie arteries and veins that branch from the internal iliac. The distal part of the external iliac artery is cleaned of fat and nodes. In our series, however, this area has not contained a positive node. It is often difficult to release the bladder at its lateral extensions from the cervix, and care and patience must be exercised here. There are apt to be blood vessels that are confusing and that bleed easily. The next step is the dissection of the left group of blood vessels and lymphatics, and the ureter and obturator fossa. When all of these are released and the uterus is free the dissection is carried down the sides of the rectosigmoid, releasing the peritoneum of the cul-de-sac of Douglas in its entirety. The cleavage plane between the vagina
and rectum is found and the rectum is dissected as far down the vagina as possible. This part of the operation is occasionally difficult and must be carried out thoroughly for it is best to remove as much as possible of the cul-de-sac. When this is done the vagina is cut across and below the growth and as much as possible is removed. Occlusion clamps across the vagina are not used. It is often noticed that, even though the operator thinks he has removed a large cuff of vagina, when the specimen is opened he is chagrined to see how little he has removed. With the uterus out and the vagina open the vagina may be sutured with a circular running stitch, not closing the vagina but around its cuff as a hemostatic stitch. At the end of the operation the blood vessels, ureters, and obturator nerves are widely exposed. The ureters look like loose telegraph wires running across the pelvis. Care is taken to see that all bleeding has ceased. Then without attempting to drain the pelvis (the vagina is open) and without supporting the vagina by any ligament, peritonealization is carried out by suturing the peritoneum of the posterior pelvic wall to the peritoneum of the raised bladder flap. Four grams of sulfanilamide are placed under the peritoneal flap and the peritoneum is closed tight. The abdominal wall is then closed in layers. It is usual during the operation to have the patient transfused as at the end of the operation a certain amount of shock can be expected. Constant bladder drainage is continued and the patient is put to bed with the foot of the bed on low shock blocks. From then on, except for sulfadiazine by mouth, the usual postoperative care is given. The patient is allowed to be out of bed on the 14th day.

Results

Of 47 selected cases in which patients were treated in the fashion described none has died, an operative mortality of 0 percent. It was essential in this series that the mortality be low for the results with radium in the radiated cases are so good that a 10 to 20 percent mortality would prohibit surgery. A mortality of 0 percent, or a very low mortality, gives the operator a feeling that at least he is as well off as is the radiologist in treating this type of disease.

The most significant complications are difficulties with the urinary tract (Table 2.). Cystitis, dilated ureters, and hydronephroses are the rule after operation, not the exception. In most cases an intravenous pyelogram taken before discharge will show large ureters and kidney pelvis, but this condition will clear up. Occasionally patients have difficulty in voiding or emptying the bladder due to injury to the sympathetic or parasympathetic nerves. In five, or 10.6 percent of the 47 cases, ureteral fistulas developed, which in all cases means ultimate nephrectomy. This is a serious complication but not a fatal one. In one patient with a huge tumor both ureters were injured. Of the cases with ureteral fistulas a nearly equal percentage had had a ureteral catheter placed at operation as had not. Three of the five patients with fistulas had previous X-ray treatment and one had a cesarean section of the low transverse cervical type four months be-

| Ureteral Injury                        | Cases | Percent |
|---------------------------------------|-------|---------|
| Ureterovaginal fistulas                | 5     | 10.6    |
| Ureteral catheterization at operation  | 17    | 38.0    |
| Ureterovaginal fistulas after catheters| 2     | 11.7    |
| Ureterovaginal fistulas without catheters| 3    | 10.0    |
fore operation. This type of cesarean section should never be done if a Wertheim operation is contemplated. There have been no vesicovaginal fistulas. The bladder was opened once and it was closed without any ill effect.

In eight, or 17 percent of cases, lymph nodes were found positive: iliac nodes in four, ureteral nodes in one, and obturator nodes in five. The examination of the removed nodes was not carried out by serial section and therefore it is quite possible that certain positive areas were overlooked in other nodes. It is extremely important, however, to realize that eight of these patients with very early lesions would have eventually died if radiation had been used. In this group with positive nodes only one patient has succumbed so far. It is too early to tell what the five-year results will be in these cases with positive nodes but they certainly will be better than in a similar radiated series.

Of the six patients with recurrent disease or non-elective cases in whom operation was forced upon the surgeon five have died, and one died of general peritonitis after operation. This is the only death in the series and, adding the groups together, makes one death in 53 patients, or 1.9 percent. The patient who died was the only one of the entire series who was not prepared with a sulfona-
mide. General peritonitis used to be the most common cause of death from surgery of cervical cancer but only one of this series of 53 cases succumbed to this infection. Of the six cases with recurrent disease one patient is still alive without disease at two years and one month and each of the others lived over a year.

Enough time has not elapsed to make the end-results (Table 3.) of any value but five are alive over three years; four, over two years; 13, over one year; and the others, for varying months under one year. Of the elective cases three died of cancer. One died of cancer of the lung two years and two months after operation, and one died of generalized metastases. He had huge pelvic nodes at operation and all were dissected out as carefully as possible. The third patient had a huge tumor and surgery should not have been undertaken. Three patients
have recurrent disease and in one of these it has been possible to obtain a positive biopsy from the vagina.

It is impossible to judge the value of preoperative X-ray treatment for the patients have not been operated upon long enough to offer any possible basis of comparison. It is the author's feeling that it does not matter whether it is used or not, but another five years will be necessary to prove this.

It is the belief of the author, though not a confirmed one, that surgery in selected cases is a better way to treat cervical cancer than is radiation.

The experience of the patients who have had both methods of treatment has always been that the surgery was much easier to tolerate than the radiation. Therefore we should not say to patients that radiation is simple; we all know better. We know how miserable the patients are after X-ray and radium. Some are sick for weeks, some for months, and some for years. Surgery is over rapidly and quickly and is certainly more comfortable for the patient than the combined radiation treatment.

It is obvious to all of us that just as we think our patients are cured, certain ones develop a recurrence after five years. Often the cancer comes back as a recurrence in the cervix. This is eliminated by surgery for there is no cervix present. Surgery of this extensive type can be done safely if we take advantage of all the precautions of modern surgery. The preparation of the patient, the maintenance of good diet, hygiene, the correction of blood chemistry, the use of transfusion, and especially the use of sulfonamides make for safer surgery. This series demonstrates that in the hands of one surgeon nearly 50 selected patients were put through a grueling operative procedure without mortality. Such results will not continue, but if the mortality can be kept low surely this method is a good one.

If it were not for injury of the ureter it would probably be safe to say that this operation is better than radiation, but a ureteral injury of 10 percent in early cervical cancer is too large. Efforts are being made to lower this percentage.

The fact that lymph nodes can be removed and that Bonney and Taussig have demonstrated that 20 percent with positive nodes survive for five years gives surgery a distinct advantage over radiation. All patients in a radiated series must die of disease. They have a one out of five chance after surgery.

It is probable that with acquired skill strong, young, thin patients with more advanced disease should be given the opportunity of surgery rather than reliance being placed entirely on radiation. If the nodes of these patients are involved in greater proportion better results will be obtained than with radiation if the mortality can be kept low.

Conclusions

1. The main reason for this paper is to demonstrate that in properly selected and properly prepared patients the Wertheim operation plus the Taussig method of dissecting the pelvic lymph nodes can be accomplished with a low mortality.

2. The number of patients with positive lymph nodes in this selected group of cases is high—17 percent.

3. Ureteral injury is the greatest drawback to this operative procedure and its incidence must be lowered.

4. It is the belief of the author that this method of treatment of cervical cancer will give better end-results than the present methods of radiation.

References

1. Bonney, V.: Am. J. Obst. 1935, 30: 815-830.
2. Lynch, F. W.: Am. J. Obst. 1931, 22: 550-559.
3. Idem. Am. J. Surg. 1940, 48: 249-254.
4. Meigs, J. V., and Jaffe, H. L.: Surg. Gyn. Obst. 1939, 69: 257-266.
5. Taussig, F. J.: Am. J. Obst. 1934, 28: 650-667.
6. Idem. Am. J. Roentg. 1935, 34: 354-363.
7. Idem. Am. J. Obst. 1943, 45: 733.
8. Warren, S.; Meigs, J. V.; Severance, A. O., and Jaffe, H. L.: Surg. Gyn. Obst. 1939, 69: 645-647.