A MORE RADICAL METHOD OF PERFORMING HYSTERECTOMY FOR CANCER OF THE UTERUS.

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The onset of carcinoma of the uterus is so insidious, and its early stage gives rise to so few disagreeable subjective symptoms, that finally, when the patient is forced by repeated hemorrhages, which usually first alarm her, to consult a physician, the disease has passed beyond the possibility of a radical operation for its cure.

The route of upward extension is almost invariably by the broad ligaments; and on account of the close attachment of the lower portion of the ligament to the cervix, the progress is rapid through the intraligamentary lymphatics, and if not checked in the early stage is soon beyond the limits of any operation.

The downward growth on the vaginal walls and the metastasis from this point is often so very extensive that it also cannot be removed by the usual methods.

A casual review of the literature of the operative treatment of carcinoma is sufficient to convince one of the inadequacy of any method of treatment; but as the operative method is the only one which offers any chance of cure or benefit at present, it should be employed in all cases where the disease has not passed beyond the palliative effect of hysterectomy.

If the broad ligaments are densely infiltrated and the cervix deeply excavated, any form of radical operation is out of the question, as there is no possibility of even alleviating the symptoms.

If on the other hand the cervix is extensively ulcerated and the broad ligaments only slightly involved, the prognosis is favorable at least for the euthanasic effect of hysterectomy, and in a certain proportion of cases the disease can be removed completely even by the ordinary methods of hysterectomy.

During the last six months the clinical courses of three inoperable cases admitted to the gynecological wards of the Johns Hopkins Hospital have been closely followed, and in reviewing the histories of these cases in conjunction with the autopsy notes, we are more than ever convinced that any measure which offers the slightest prospect of mitigating the agonizing pain and relieving the symptoms caused by pressure of the growth upon the rectum and ureters should urgently be advised.

Death in cases which are not operated upon is usually caused by obstruction of the ureters (uræmia), peritonitis, or toxæmia from septic absorption.

The involvement of the ureters is usually late, but many weeks before this complication arises the sacral plexus may be pressed upon in one or both sides of the pelvis by the carcinomatous masses wedged into the inferior strait, and the patient suffer the most agonizing sacral and sciatic pain.

One of the three cases just referred to was of this type. The patient was admitted to the hospital six months before her death, and throughout the remaining days of her life was not free from pain a single hour, even under the influence of large doses of morphine.

The autopsy revealed a dense board-like infiltration of the broad ligaments which extended out to the pelvic wall, involving the sacral plexus at its points of egress from the sacrum. In this case had the uterus and broad ligaments been totally extirpated, even six months before the patient was admitted, the progress of the disease would probably not have been arrested, but she would have been spared the frightful agony of the last six months of her life by the relief of the pressure on the nerves. The left ureter in this case was completely blocked, and in addition to the pressure pains which she suffered there was present a partial uræmic toxæmia for three months before death which caused constant nausea and considerable vomiting.

The second patient, a mulatto woman, was admitted three months before death with a deep crater-like excavation of the cervix and dense induration of the broad ligaments. She suffered intense pain, which was only partially controlled by morphine, and at last died of peritonitis from perforation of the lateral wall of the uterus into the peritoneal cavity. Her abdomen became intensely tympanitic, and for five days before death her temperature ran as high as 105° to 107° F.

In the third case death resulted from uræmia, both ureters being blocked, and in addition there was a pyelonephrosis and ureteritis on one side. For 72 hours before death there was total suppression of urine. In these cases we have exemplified the three usual terminations of carcinoma which are not subjected to operation: (1) asthenia and uræmia from toxic absorption; (2) peritonitis from perforation of the uterus, and (3) uræmia, and pyelonephrosis from septic infection. These three cases also give us a vivid composite picture of the frightful suffering which these unfortunate women experienced.

The offensive discharge from the necrotic tissue is another excessively disagreeable symptom which invariably appears as soon as the ulcerative process is well under way, and can only be stopped by a complete removal of the carcinomatous tissue. This is of itself a justifiable indication for operation, as the discharge is always checked for some time, and frequently does not reappear even though the disease continues to extend.

It is Dr. Kelly's rule to advise hysterectomy in all cases which have not passed beyond the limit of the palliative effect of the operation, even though there is no possibility of a cure, simply for the relief of the inevitable symptoms which must arise if the uterus is not removed.

For the radical cure of cancer of the uterus the same surgical rule obtains as in cancer of other regions, viz. total extirpation of the primary focus and as extensive areas of adjacent tissue as possible to insure the complete eradication of the disease.

It cannot be gainsaid that it is better to have a local recurrence and ultimate death from metastasis following the removal of the uterus, with a decided amelioration of the usual distressing symptoms, than to have these symptoms increasing in their severity until death without operation.

The faults common to all methods of removing the uterus are (1) the broad ligaments are cut too close to the uterus, and (2) too small portions of the vagina are removed. (Fig. III.)

In at least 95 per cent. of cases where there is upward extension of the disease it is through the lymphatics of the broad ligaments. The local recurrence which we so often see on the margins of the vaginal incision also demonstrates very clearly the fact that usually too little of the vagina is removed.

In carcinoma of the fundus the extension is invariably through the broad ligaments, and any operation which removes a considerable portion of these structures offers the greatest hope of a permanent cure.

The usual methods of performing hysterectomy have been extremely unsatisfactory to every gynecologist, for the reason that only a small portion of the broad ligaments is removed and the remainder usually conceals nests of epithelial cells which fall outside the limit of the knife. The same may be said of the vagina. The results of the pathological examination of the uteri removed by hysterectomy in the Johns Hopkins Hospital not only definitely sustain this clinical observation, but also point strongly to the necessity of a more radical method than yet proposed.

Of the last 20 cases, the specimens have been submitted to a most careful pathological examination, which has shown that in 15 cases the carcinomatous process had passed beyond the limit of operation; in one case the result was doubtful, and in only four cases could it be definitely said that all of the disease had been completely removed.*

No stronger argument than this can be advanced for a more radical operation.

In at least five instances where the extension had occurred along either one or both broad ligaments, the carcinoma could not have passed more than a few millimeters beyond the limit of operation, as the epithelial cells were very sparse and were only barely perceptible in the margins of the incision.

In other cases there was no involvement of the broad ligament, but too little of the vaginal wall had been excised.

In comparing Fig. III of a uterus removed by vaginal hysterectomy and Fig. IV of the specimen from Case II which was removed by the method which I shall describe, it will be seen that none of the broad ligament or the vaginal wall is removed with the former, while with the latter there is a large portion of the broad ligaments and a considerable cuff of vagina.

The great danger of cutting or ligating the ureters in the past (Fig. II) has prevented a wide excision of the broad ligaments, but now that Dr. Kelly has entirely removed this danger by introducing bougies into the ureters in all operations where they may be involved, we can turn our attention with greater confidence to the more extensive extirpation of the tissues adjacent to the uterus.

The value of this procedure has been frequently demonstrated in Dr. Kelly's clinic, and if generally adopted will no doubt save many lives which are lost from cutting or tying the ureters.

After laying a plan before Dr. Kelly for the more complete extirpation of the uterus, the broad ligaments and a portion of the vagina, and receiving his cordial endorsement and encouragement, I was granted the opportunity in April, 1895, to put into effect the principles embodied in the proposed operation. There are three essential steps in this operation which differ from those now employed: 1st, the introduction of the bougies; 2d, the ligation of the upper portions of the broad ligaments, including the round ligaments and ovarian arteries, cutting them close to the pelvic walls, opening the two layers and dissecting the uterine artery out to its origin and ligating before excising any tissue, and 3d, the excision of a much larger portion of the vagina than usual.

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* In a forthcoming article by Dr. Russell upon the clinical course of cases subsequent to hysterectomy for carcinoma in the Johns Hopkins Hospital, it will appear that there is a greater percentage of permanent cures than the pathological examination of these 20 cases would seem to indicate. From the opening of the hospital in 1889 to August 1894, 48 hysterectomies were performed; of this number 41 were vaginal, 4 abdominal and 3 combined vaginal and abdominal. The results of these operations are as follows: 5 died from the primary effect of the operation, 17 died subsequently from extension of the disease, 6 have not been heard from, and 20 *are still living*. Assuming that of the 6 not yet heard from 3 are living and 3 dead, there are 48 per cent of these cases still living, certainly a very gratifying result, as it has now been nearly a year since the last of this series of cases was operated upon.

By carefully ligating the artery in this way, and introducing the bougies, we eliminate the dangers of hemorrhage and of injury to the ureters, and are enabled to extirpate the uterus, its broad ligaments, and the upper portion of the vagina *en masse*.

The value of excising the carcinomatous tissue in one piece is dwelt upon with much stress by Dr. Halsted in the description of his operation for cancer of the breast, by means of which he has reduced the ratio of local recurrence from 50 to 20 per cent.* The same rule must hold good here.

He says "the suspected tissue should be removed in one piece: (1) lest the wound become infected by the division of tissue invaded by the disease or of lymphatic vessels containing cancer cells, and (2) because shreds or pieces of cancerous tissue might readily be overlooked in a piecemeal extirpation."

The principal reason for the careful dissection and exposure of the uterine artery is that one can tie it well out in its course and then, by making traction on the uterus towards the opposite side from which we are cutting, the broad ligament can be cut away close to its pelvic attachment, Figs. I and IV.

If one attempts to ligate the artery in the tissues any distance from the uterus without first dissecting it out, there is great danger of including carcinomatous tissue within the ligature and thus defeating the object of the operation.

Another reason for first ligating the artery as far out as possible is that there is no possibility of removing any more tissue after the broad ligament is once divided, as that portion attached to the pelvic wall at once retracts, carrying with it the artery and any carcinomatous tissue which may lie beyond the ligatures. This is the essential principle in the operation which is now proposed, and if followed will unquestionably give better results than where the broad ligament is ligated with one or two ligatures *en masse* and cut away close to the uterus.

While the introduction of the bougies is highly essential to this operation, it can be performed, but with much less facility, by following the course pursued on one side in Case I.

The bougie was not introduced in the right ureter for reasons stated further on, and when the enucleation was begun it was found necessary to dissect out the ureter in its course and draw it to one side with a loose traction ligature, after which the operation was completed with as much ease as on the side where the bougie was introduced.

This necessarily requires more time, and consequently it should be the invariable rule to lay bougies in both ureters, as the operation must be done with the most painstaking care if it is to be of any more value than the methods now pursued.

The details of the operation will be given in the description of the cases, and in the remarks following Case I defective points in the *technique* are noted which are corrected in Case II.

Case I.—Mrs. J. P., mulatto, aged 48 years, admitted April 24, 1895.

Complaint—Hemorrhage from uterus and offensive vaginal discharge.

Marital History—Married 25 years; 12 children; no miscarriages. All labors normal except the last in November, 1894; child still-born. Menses began when she was 14 years of age; flow always regular and painless, lasting one and a half days. Since the birth of her last child she has had almost constant hemorrhage.

Leucorrhœa for many years; up to six months ago the discharge was odorless, but at that time became very profuse and offensive.

Family History—Negative.

Personal History—Patient has always been a very healthy woman.

Present Ailment—In August, 1894, when patient was about six months pregnant, the leucorrhœal discharge above noted became very offensive and irritating, and she began to grow weak and lose flesh. November 16th, 1895, she gave birth to a still-born child, and about one month later had a copious hemorrhage from the vagina, which has continued more or less up to the time of her admission to the hospital. She has at no time suffered the slightest pain, and barring the weakness and general debility, which is more apparent to her friends than herself, feels very well. Urination normal, bowels costive, no pain during defecation. Patient is anæmic and has lost considerable flesh. Appetite poor, sleeps moderately well.

Examination—Abdominal walls lax and flabby, numerous linea albicantes. Vaginal outlet much relaxed; beginning on the vaginal wall 2½ cm. from the cervix there is a fungating mass which almost fills the vagina and completely involves the cervix. The broad ligaments are slightly involved close to the uterus. The fundus uteri is slightly enlarged and freely movable. Appendages normal.

Diagnosis—Cancer of upper portion of vagina and cervix.

Operation, April 26, 1895—Urethra anæsthetized with cocaine, and ureteral bougie inserted into the left ureter through a No. 8 vesical speculum. The patient being very nervous, and as the right broad ligament seemed quite free, it was deemed best to proceed at once with the general anæsthetic, only a slight attempt having been made to lay a bougie in this side, which was not successful. An incision 15 cm. in length in the median line exposed the pelvic organs, which were found as described in the examination. The bougie in the left ureter could be felt as a solid cord running up along the side of the cervix and then curving gently outward in company with the iliac vessels and up over the brim of the pelvis. At the base of the broad ligament it lay at least 1½ to 2 cm. outside of the indurated area, and could easily be displaced 1 cm. further out towards the pelvic wall, thus throwing it entirely out of the carcinomatous process.

The operation was begun by tying the upper portion of the left broad ligament, including the ovarian artery, as closely to the pelvic wall as possible, clamping the uterine side and cutting between.

Having divided the round and the upper portion of the broad ligaments, and separated the two layers of the latter, the vesical peritoneum was snipped with the scissors, following the crease where it is reflected onto the uterus, around the anterior

* The Johns Hopkins Hospital Reports, Vol. IV, No. 6.

face of the uterus to the opposite broad ligament. By spreading the layers of the broad ligament apart with a stalk sponge the uterine artery was exposed in the intraligamentary cellular tissue, it appearing somewhat tortuous, and near the uterus imbedded in carcinomatous tissue. A careful dissection was now begun, an assistant in the meantime making strong traction with a small vulsellum forceps caught in the fundus, thus enlarging the normal space between the uterus and pelvic wall and making the artery taut.

The artery was bared for 2½ cm. from the uterus, the dissection being carried well down towards the internal iliac artery, which could be seen pulsating close to the point of ligation. A small blunt-pointed curved aneurism needle proved of great service in carrying the ligature. As the vessel walls seemed somewhat atheromatous, a second ligature was placed for double security. This step in the operation was rather difficult on account of the close proximity to the large vessels, which were in danger of injury. During this dissection the ureter was constantly under touch, thus eliminating all possibility of injuring it.

The ureter was next dissected out of its bed and pushed toward the pelvic wall; and the broad ligament and the intraligamentary tissue ligated on the pelvic side close to the internal iliac vessels, with imbricated ligatures, each including 1 cm. of tissue.

Having reached the vaginal vault, the dissection was carried down along the lateral and anterior vaginal walls with the fingers, by means of which the walls were pushed away from their attachments. There had not been the slightest loss of blood up to this point.

The upper portion of the opposite broad ligament was now ligated on the pelvic side and clamped on the uterine side and cut. The two layers were then separated with a stalk sponge, the uterine artery dissected out and doubly ligated. At this point careful palpation showed the broad ligament to be more extensively involved than the preliminary examination had indicated, and in order to remove as much as possible it became necessary to know the exact position of the ureter lest it inadvertently be ligated or cut.

With the other ureter as a comparative landmark, this ureter was easily located in the broad ligament and dissected out. A loose traction ligature was then thrown around it, and while the dissection was being carried down back of the vaginal walls, was drawn out of the way by an assistant. The broad ligament was ligated close to the pelvic wall as on the opposite side and cut. At this point it became evident that the carcinomatous process had not only penetrated the posterior vaginal wall, but had involved the anterior rectal wall to a considerable extent.

On account of the close relation of the rectal and vaginal walls which were bound together by the inflammatory process, an assistant was directed to insert his index-finger into the rectum while an attempt was made to separate the two walls. This could not be accomplished satisfactorily. The recto-uterine reflection of peritoneum had been previously snipped and pushed off in the same manner as the vesico-uterine reflection. By making strong upward traction on the uterus, the vagina was also drawn upward and made quite tense. By light percussion, a procedure suggested by Dr. Kelly to be employed in all cases of hysterectomy for accurately distinguishing the cervico-vaginal juncture, the point for amputation can be located accurately. An opening was made in the anterior vaginal wall with the sharp-pointed scissors, and from this point the vagina was encircled by an incision made with Dr. Kelly's special hysterectomy spud, which proved of great value here in cutting so deep in the pelvis. Unfortunately a small area of carcinomatous tissue on the rectum could not be removed. With this exception the enucleation seemed to be very thorough. Considerable bleeding from the vaginal walls, which required several ligatures to control it, followed the amputation of the vagina. Before completing the operation another attempt was made to clear the rectal wall of the carcinomatous tissue by a careful dissection, but proved impossible. One or two large strips of iodoformized gauze were packed down into the space occupied by the cervix and upper portion of the vagina, after which the pelvic cavity was closed by whipping together the recto-uterine and vesico-uterine reflections of peritoneum by a continuous suture, beginning at the stump of one ovarian artery and running across to the opposite stump, thus effectually closing off the peritoneal cavity, which was then irrigated with 1 litre of normal salt solution (Fig. V). The abdominal wound was closed with buried silver wire and subcutaneous catgut.

The vaginal gauze was removed in five days. Patient discharged in 24 days. Examination at this time as follows: Vaginal vault smooth and vaulted, small line of cleavage felt where the vaginal walls have united. No sign of local recurrence of the disease.

The pathological examination had by this time been made by Dr. Cullen, who confirmed the clinical observation that all of the carcinoma had not been removed, consequently the patient was requested to return in one month for examination.

June 20—Patient examined to-day, and on the anterior rectal wall there is a minute area which is unquestionably carcinomatous. The patient is perfectly comfortable, has gained five pounds, the hemorrhages have not appeared and she believes she is perfectly well. The pelvis appears to be free, and by rectum there is no trace of induration on either side.

Remarks.—While the dissection of the ureter in which no bougie was introduced was satisfactorily accomplished, it was much slower than on the opposite side, and in contrast much more difficult. The bleeding from the vaginal walls following the excision of the uterus should be obviated by first perforating with sharp scissors the vagina anteriorly well below the carcinomatous area and then ligating the vaginal wall in small segments and cutting, thus controlling all hemorrhage as the operation proceeds (vid. Case II).

With the exception of the one point on the rectum which could not be removed, the operation was very satisfactory. As far as the question of complete cure is concerned, unfortunately for the patient this is quite as serious as though a much larger area was left.

CASE II.—Mrs. E. Y., German housewife, aged 57 years, admitted June 4th, 1895.

Complaint—Excessive loss of blood from uterus.

Marital History—Married twice, one child and one miscarriage during first marriage, labors easy and not followed by any untoward symptoms. Married 22 years to second husband, during which time she has borne three children and had ten miscarriages. Nothing out of the normal course of events occurred in any of the labors, and no pain or discomfort followed the miscarriages. She was attended in all of her confinements by a German midwife. Menopause occurred in her 47th year, up to that time menses always regular and normal since they first appeared in her 19th year.

Family History—Negative.

Personal History—Patient has always been very strong and healthy since childhood.

Present Ailment—One year ago she began to have a slight leucorrhœal discharge, which continued for six months, when it became blood-tinged; since then it has grown more profuse and hemorrhagic until the present, when it is almost pure blood.

About Easter, 1895, she had a severe hemorrhage, losing about one pint of blood.

General Condition—Slight anæmia, no cachexia, very slight pain in lower part of pelvis, no loss of flesh. Appetite good, bowels regular, no urinary complaint. Heart and lungs normal.

Examination—Vaginal outlet relaxed, faint scar tissue in posterior vaginal wall. Projecting into vagina from cervix there is a fungating mass 2.5x5 cm., which is very friable and bleeds freely during the examination.

The cancerous process seems to be circumscribed and extends only slightly onto the vaginal walls. Fundus uteri small, senile, freely movable, not involved by the carcinoma. Broad ligaments very slightly involved. Ovaries not detected, probably senile.

Diagnosis—Cancer of cervix.

Operation, June 6, 1895—Urethra anæsthetized with cocaine and patient placed in knee-breast posture. After an ineffectual search for the ureteral orifices it was considered best to place the patient in the elevated dorsal posture, when they were quickly located and bougies inserted into both.

Especial care was observed in this case as in the preceding to disinfect thoroughly the vagina. The broad ligaments were tied off and the dissection of the artery made in the same way as in the preceding operation.

After freeing the vaginal walls for 2½ cm. below the cervix, the vagina was perforated anteriorly, but instead of at once completing the amputation, a small segment of the vaginal wall was ligated and cut and then another, and so on around the entire circumference, so that by the time the uterus with the upper portion of the vagina had been removed all bleeding was checked.

The operation was completed by packing gauze into the upper part of the vagina and closing the peritoneum over this, making the seat of operation entirely extra-peritoneal. This operation required two hours for its completion, the dissection of the uterine arteries requiring more time than any other step. It was practically bloodless and there was no variation in the patient's pulse from the beginning to the end.

The subsequent notes on the case are as follows:

June 7th—Patient recovered from ether by the time she reached the ward; at that time her pulse was 92, full and strong. She has passed a comfortable night. Temperature 99½° F.; pulse 100 this morning.

June 9th—Bowels moved thoroughly from the effects of fractional doses of calomel and an enema. Feels well; no tenderness or distension in abdomen.

June 10th—Gauze pack removed from vagina; no odor; slightly blood-stained.

June 18th—Temperature normal; abdominal wound inspected; subcutaneous catgut absorbed, union perfect, line of incision represented by only a faint hair-line.

July 5th—Patient discharged, feeling perfectly well. Highest temperature on fourth day 100° F.; pulse 112. The vaginal vault is entirely closed in, is perfectly smooth and dome-like. The line of union between its walls is represented by a small, almost imperceptible cicatrix. No induration in the lateral pelvic walls. Prognosis as to radical cure good.

August 30th—Patient returns to-day by appointment; again examined and same condition found as just noted.

In conclusion, the steps of this operation may be summarized as follows:

1. Insert bougies under the local effects of cocaine, thus saving time and conserving the patient's vital powers for the operation.
2. Make abdominal incision of sufficient length to insure free manual movements.
3. Ligate upper portion of broad ligament with ovarian artery; divide vesico-uterine peritoneum around to opposite side; push bladder off, and spread layers of ligament apart, exposing uterine artery.
4. *Dissect uterine artery out for 2½ cm. from uterus beyond its vaginal branch and tie.*
5. Dissect ureter free in the base of the broad ligament.
6. Ligate remainder of broad ligament close to iliac vessels and cut it away from its pelvic attachment.
7. Carry dissection well down below carcinomatous area, even though cervix alone seems to be involved.
8. Proceed on the opposite side in the same manner as on the first side.
9. Perforate vagina with sharp-pointed scissors, making strong traction on uterus with small vulsellum forceps so as to pull the vagina up and make its walls tense, then ligate in small segments (1 cm.), and cut each segment as it is tied.
10. Insert iodoformized gauze from above into raw space left by the hysterectomy; draw vesical and rectal peritoneum over this with a continuous fine silk suture.
11. Irrigate pelvic cavity and close abdomen without drainage.

July 15, 1895.

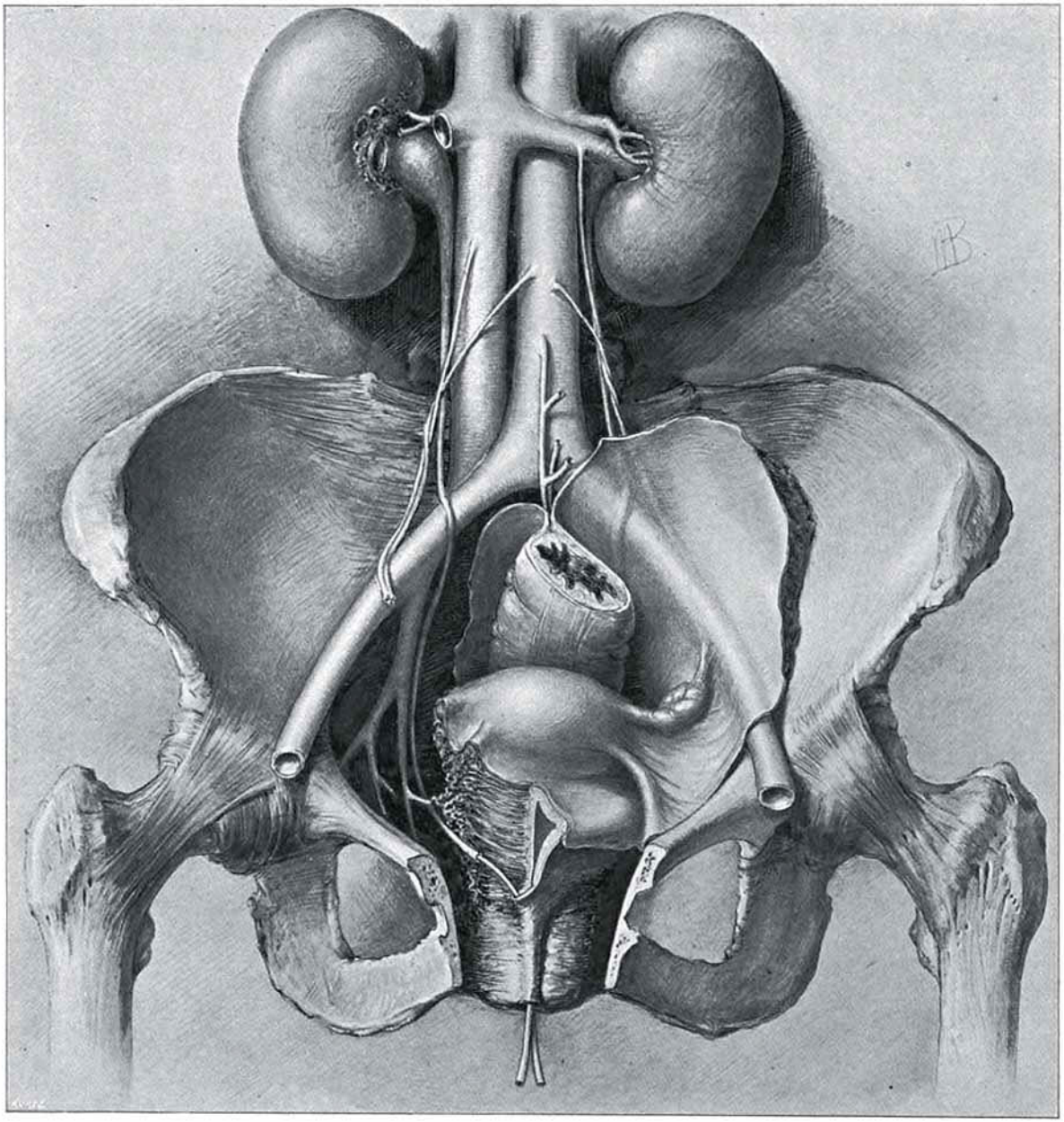

FIG. I.

In this plate the peritoneum of one side of the pelvis is dissected off, showing the intimate anatomical relation of the bladder, uterus, uterine artery and ureter. Bougies are inserted into the ureters making them stand out as rigid tubes. The close relations of uterine artery and ureter and the ureter and cervical portion of uterus are well demonstrated, showing the impossibility of a wide excision of the broad ligaments without the introduction of the bougies into the ureters.

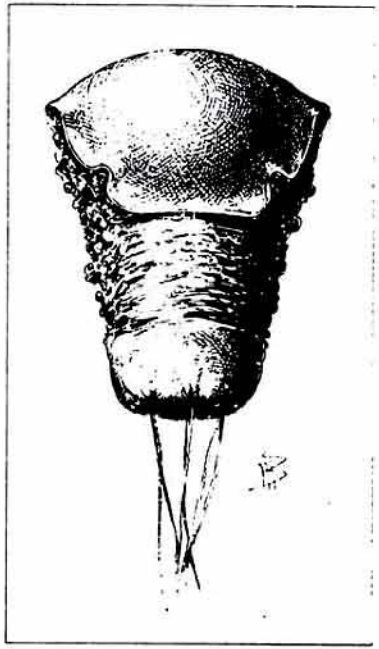

FIG. III.

Uterus removed by vaginal hysterectomy, none of the broad ligaments or vagina excised with it.

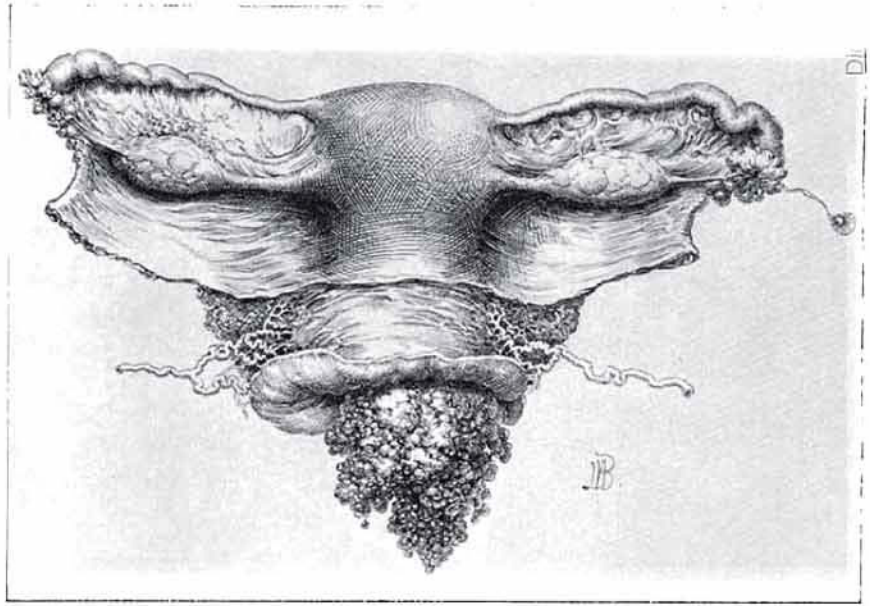

FIG. IV.

Uterus removed from Case II., showing the uterine artery as dissected out before the broad ligaments were freed from their pelvic attachments. The major portion of the broad ligaments and a considerable cuff of vagina were excised with the uterus *en masse*.

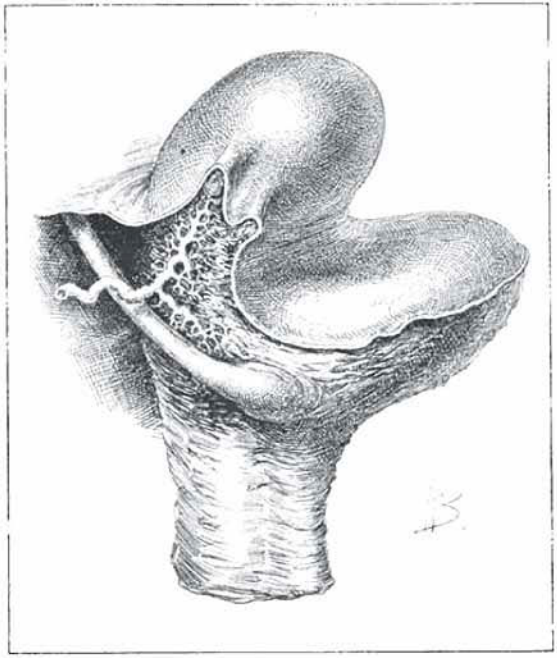

FIG. II.

Peritoneum dissected off, giving a lateral view of the uterus and bladder with their relations to the uterine artery and ureter and the latter vessels to each other. The impossibility of removing any of the broad ligament without great danger of cutting or ligating the ureters is perfectly demonstrated in this plate.

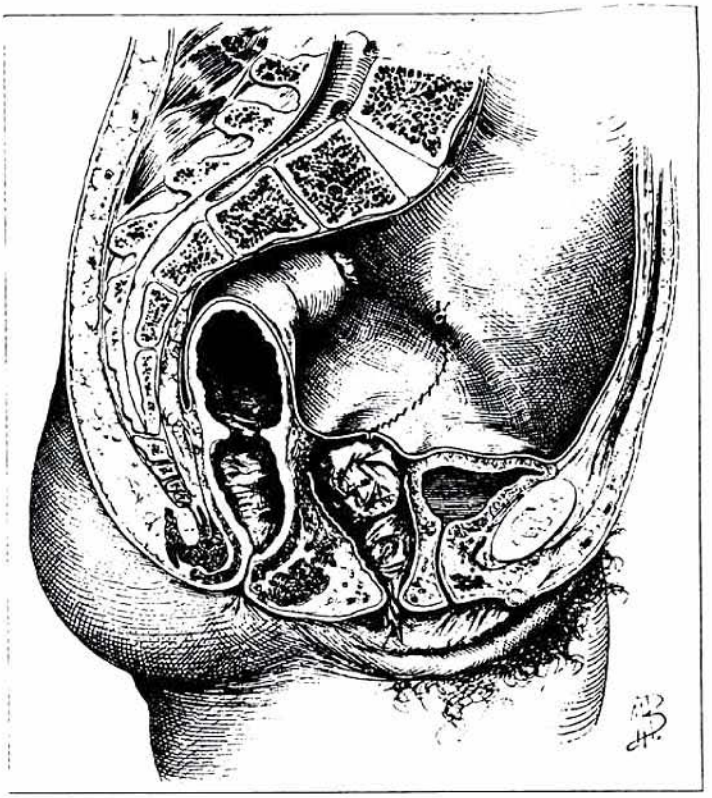

FIG. V.

Operation as it appears when completed. The space left by the removal of the uterus is filled with gauze from above, after which the vesical and rectal peritoneum are whipped over it with a continuous suture of fine silk, beginning at one ovarian stump and running across to the opposite stump.