

END-TO-END APPROXIMATION OF THE BROAD
LIGAMENTS AND OTHER POINTS OF
TECHNIQUE IN ABDOMINAL
HYSTERO-MYOMECTOMY.

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Abdominal hystero-myomectomy may be, supravaginal, in which the tumor, corpus uteri and supravaginal portion of the cervix are removed, or, complete, in which the tumor and entire uterus are removed. The two operations will be considered separately.

SUPRAVAGINAL HYSTERO-MYOMECTOMY.

The usual operation is to secure the ovarian and uterine arteries by means of strong catgut ligatures and after the removal of the tumor, corpus uteri and supravaginal portion of the cervix, to close the uterine stump by means of a continuous suture running from side to side and then to close the wound in the broad ligaments by means of another continuous suture also running in the same direction (Fig. 1). This method is open to the following objections: 1. The severed broad ligaments retract to the sides of the pelvis where they can no longer give adequate support to the bladder, vagina and the rectum, and where they consequently permit



Fig. 1.—Supravaginal hystero-myomectomy. The ovarian and uterine arteries have been secured by means of strong catgut ligatures; the uterine stump has been closed by a continuous suture running from side to side and the wound in the broad ligaments is being whipped together by a continuous catgut suture running in the same direction. The ligatures on the uterine arteries are covered in by peritoneum; those on the ovarian arteries are not so covered.

exaggerated descent of the pelvic floor with disabling and permanent cystocele and rectocele. 2. The rectum and bladder are brought into close relations with only a thin wall between them so that the possibility of infection from one to the other is increased. 3. In many cases the bladder is drawn over the uterine stump in order to cover it and this may give rise to mechanical irritation of the bladder. The author has attempted to overcome the difficulties above mentioned by closing the uterine stump in the antero-posterior direction and the broad ligaments in the same direction by end-to-end approximation. This method will be set forth under the following description of technique:

Technique of Supravaginal Hystero-myomectomy.—

The steps of the operation are these:

- A. Abdominal incision.
- B. Delivery of the tumor through the abdominal wound.
- C. Ligature of the ovarian and uterine arteries and

removal of the tumor together with the corpus and supravaginal portion of the cervix uteri.

D. Toilet of the peritoneum.

E. Closure of the abdominal wound.

A. In case of a large tumor the abdominal incision should be made nearer the umbilicus than the pubes, to

tinue, be sufficiently enlarged to permit the delivery of the tumor.

B. The delivery of the tumor through the abdominal wound is sometimes made by pressure on the abdominal walls around the incision, so as to squeeze it out as one would squeeze pus out after opening an abscess.

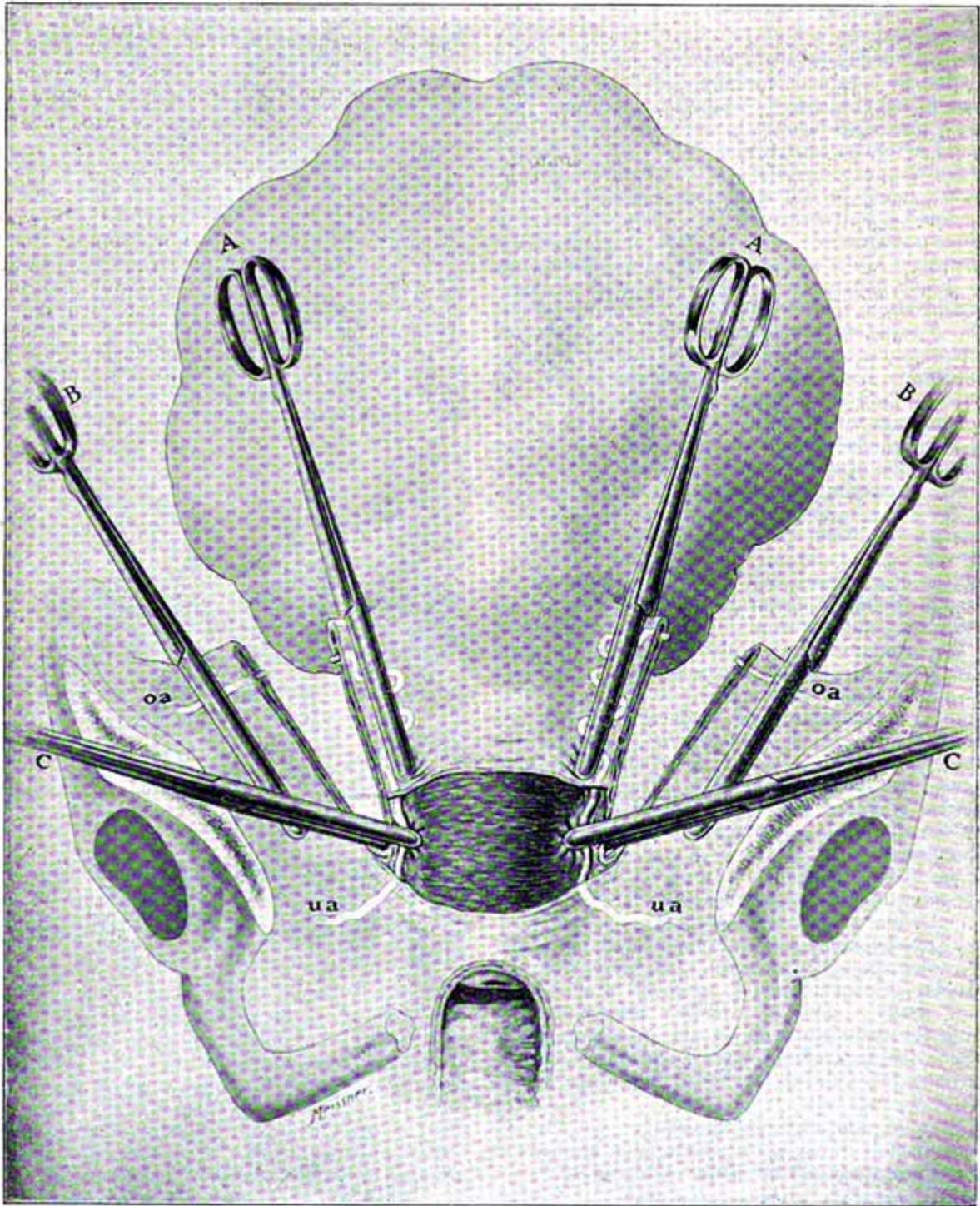


Fig. 2.—Supravaginal hysteromyomectomy. Forceps B B clamp the ovarian artery as it passes inward through the broad ligament toward the uterus. Forceps A A clamp the ligament close to the uterus and prevent reflex hemorrhage from the utero-ovarian anastomosis at the uterine end of the broad ligament. On either side the broad ligament has been divided by means of scissors between forceps A and B. The peritoneal investment of the uterus all around the cervix has been divided just above the level of the bladder attachment. The circumuterine peritoneum together with the attached bladder has been stripped down toward the vaginal portion of the cervix to the region of the uterine arteries. The uterine arteries have been clamped by means of forceps C C.

avoid the bladder, which by the growth of the tumor is not infrequently drawn up out of the pelvis. The incision, first exploratory—that is, large enough to admit one or two fingers—may, if the operation is to con-

Usually, however, the tumor is delivered by traction with the hands or with heavy vulsellum forceps. In many cases the tumor is so firmly fixed in the pelvis that it can not be brought through the abdominal wound until

after some of the ligatures have been placed around the arteries and the mass partially severed from the broad ligaments. If the abdominal incision has been very long, and the intestines are much inclined to protrude through the wound, they may, as soon as the tumor has been brought through, be held back by large flat gauze pads,

facilitated by the use of long-bladed forceps to secure temporary hemostasis of the uterine and ovarian arteries while the mass is being removed. This use of the forceps will enable the operator to get the tumor rapidly out of the way and to complete the operation with great speed and during the operation to avoid hemorrhage.

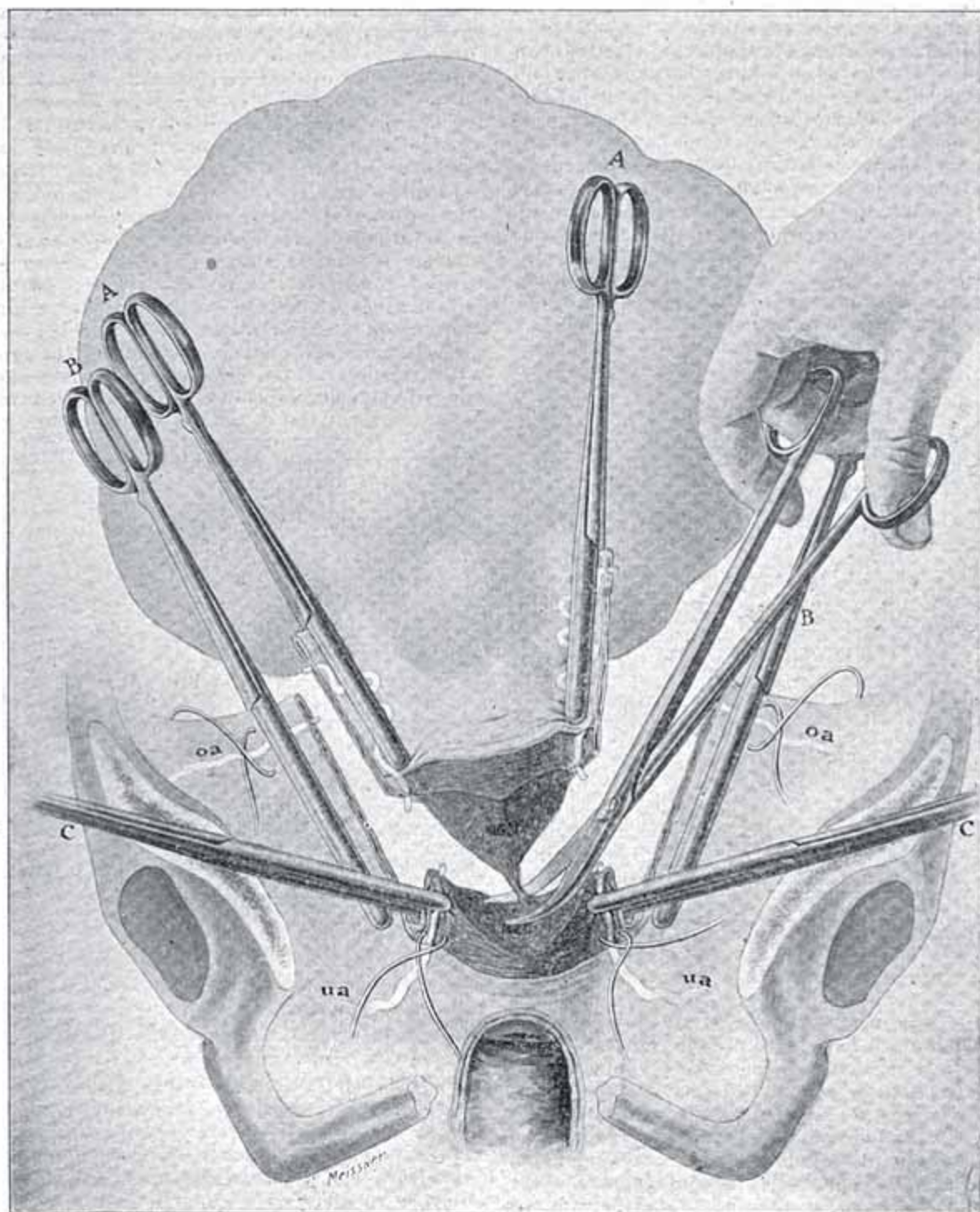


Fig. 3.—Supravaginal hysteromyomectomy. Forceps A A, B B and C C in place as shown in Fig. 2; ligatures for permanent hemostasis of the uterine and ovarian arteries in place, but not tied. Uterus being removed by scissors in such a way that the uterine stump may be sutured in a line from before backward instead of from side to side.

or by suture of the upper part of the wound. It is clearly important to prevent protrusion of the intestines and thereby to lessen exposure of the peritoneum.

C. In a majority of all cases of hysteromyomectomy, whether complete or incomplete, the operation may be

Figures 2 and 3 show the forceps in place, AA and BB securing the ovarian and CC securing the uterine arteries. The steps of this part of the operation are shown in Figs. 2 to 5 and are:

1. Clamp the arteries as shown in the diagrams; for-

ceps BB shut off the ovarian artery as it passes inward through the broad ligament toward the uterus; forceps AA prevent reflex hemorrhage from the utero-ovarian anastomosis at the uterine end of the broad ligament.

2. Divide the broad ligaments by means of scissors.

3. Divide the peritoneal investment of the uterus all around the cervix just above the bladder attachment; this is best done by lightly cutting around the uterus with a scalpel or pointed scissors.

4. Strip the circumuterine peritoneum together with the attached bladder down toward the vaginal portion of the cervix to the region of the uterine arteries. While stripping off the bladder its relations may be recognized by a sound in that viscus.

5. Clamp the uterine arteries by means of forceps or ligature them at once; in applying the ligatures, care is necessary to avoid the ureters which sometimes run very close to the uterus. Some operators take the precaution to have a catheter in each ureter as a guide during the operation.

6. Remove the tumor and all the uterus except the vaginal portion of the cervix by a wedge-shaped incision so directed that the uterine stump may be sutured in a

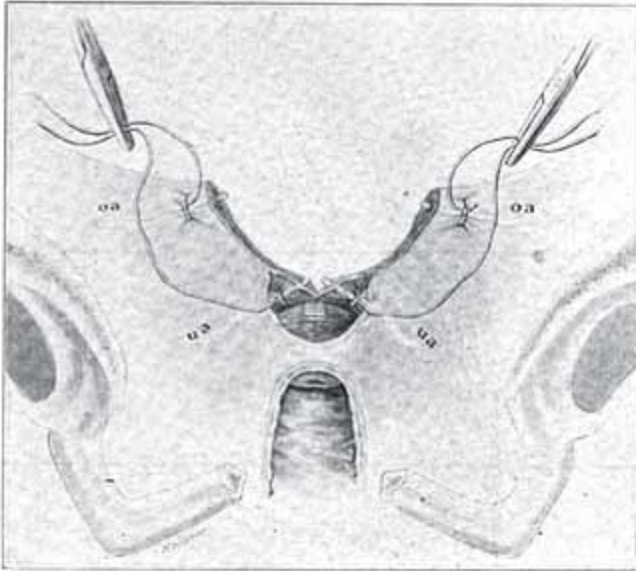


Fig. 4.—Supravaginal hysteromyomectomy. Ovarian arteries o a., o a., and uterine arteries u a., u a., secured by the ligatures which were shown in place, but not tied in Fig. 3. One free end of each of these ligatures is cut short and the others are held in pressure forceps. Uterine stump closed by continuous suture in antero-posterior direction.

line from before backward, not from side to side (Fig. 3).

7. Place permanent ligatures on the ovarian and uterine arteries and remove the pressure forceps. It is important that the forceps be loosened by an assistant while the ligatures are being drawn tight, because if tied before the forceps are removed dangerous hemorrhage may result. The uterine arteries are located sometimes by sight, sometimes by touch and are accordingly secured by ligature, isolated or *en masse*. In some cases the tumor so fills the pelvis that the forceps for want of room can not be applied. Then, a rubber ligature having been thrown around the cervix for temporary hemostasis, the tumor may be enucleated and the size of the mass so reduced that the forceps may be applied. As the incision is carried down through the broad ligament on each side, additional forceps, if needed to control hemorrhage, may be used until the entire mass—tumor, corpus uteri, and supravaginal portion of the

cervix—has been removed, then permanent ligatures on the ovarian and uterine arteries may be substituted for the forceps.

D. The toilet of the peritoneum consists of the following steps: 1, ligature of any bleeding points; 2, cauterization of the cervical canal with 95 per cent. carbolic acid; this may be applied on a probe or grooved director; sponges and instruments used in connection with the cervical canal should for reasons of asepsis not be used elsewhere; 3, closure of the cervical canal by suture and covering of all exposed surfaces with peritoneum (the author's method of uniting the cervical stump by a line of union in the antero-posterior direction and of bringing together the broad ligaments by end-to-end approximation is set forth in Figures 3 to 8; 4, drainage if required.

In supravaginal hysteromyomectomy drainage is usually not required; i. e., if drainage is indicated it would generally be wise to remove the entire uterus, but if drainage is required it is best made with a continuous strip of gauze passed from above downward through a free opening posterior to the cervix into the vagina; this opening should be enlarged by splitting the posterior wall of the cervix, and if necessary also the anterior wall. A gauze drain should usually be removed through the vagina about two days after the operation and the

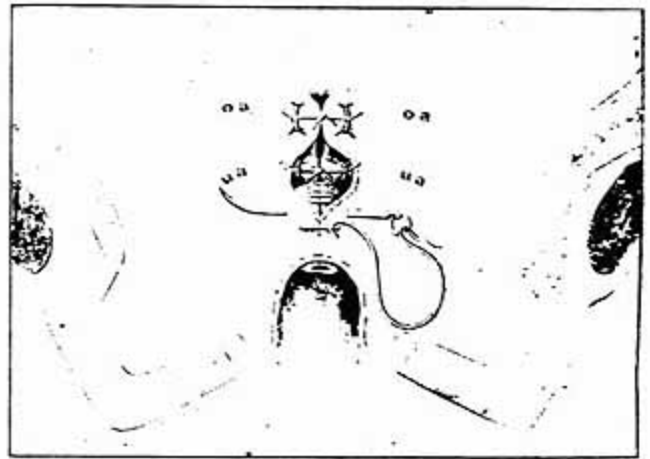


Fig. 6.—Supravaginal hysteromyomectomy. o a., o a., ovarian arteries; u a., u a., uterine arteries; the cut ends of the two broad ligaments are brought together—end-to-end approximation—by tying the catgut ligatures which are shown in the grasp of pressure forceps, Fig. 4. The tying of these ligatures brings the broad ligaments into position for final end-to-end union by a continuous suture. The needle here shows the beginning of this suture.

removal of it followed by gentle douches of 0.5 per cent. lycol in sterile water.

E. The abdominal wound should be closed in the usual manner without drain.

COMPLETE ABDOMINAL HYSTERO-MYOMECTOMY.

The removal of the entire myomatous uterus is indicated; first, when the cervix uteri is septic or otherwise so diseased as to render the presence of any part of it unsafe; second, when on account of extensive traumatism or suppuration vaginal drainage is required. In addition to the above indications there is a certain legitimate latitude of choice so that the bias of the operator may be in the direction of complete hysterectomy.

The abdominal incision, the delivery of tumor, the clamping and ligature of the arteries, the division of the broad ligaments and the closure of the wounds, both pelvic and abdominal, are substantially the same as al-

ready described for supravaginal hysteromyomectomy. The following description of complete hysterectomy contains, however, certain peculiarities in technique:

Excision of the Uterus.—When the cervix is accessible through the vagina the first incisions may be made as for vaginal hysterectomy, the bladder and the rectum being stripped away from the cervix, sometimes as far as the peritoneal cavity. The broad ligaments may be separated through the vagina and tied off as high as practicable. In some cases the uterine arteries may be reached and ligatured. The vagina having been temporarily packed with a continuous strip of gauze, the final removal of the uterus through the abdomen will be found easy in consequence of the vaginal detachment. The removal of the uterus is performed as already de-

be easy. If the incisions have not extended so far, the removal will not be difficult; but if no vaginal incisions have been made, the operator may in some cases find it quite tedious, if not difficult, to work his way down into the vagina. The attempt has occasionally resulted in opening the rectum, bladder, or ureter. This difficulty may largely be overcome by a simple device as follows:

The bladder having been stripped off the cervix as far down as possible toward the vagina, the uterus is drawn by means of vulsellum forceps well up through the abdominal wound. This traction exposes the anterior wall of the cervix, which is now freely divided with sharp scissors by a longitudinal incision and the cervical canal thereby laid open (Fig. 9). One blade of the scissors is now passed directly down through the external os to

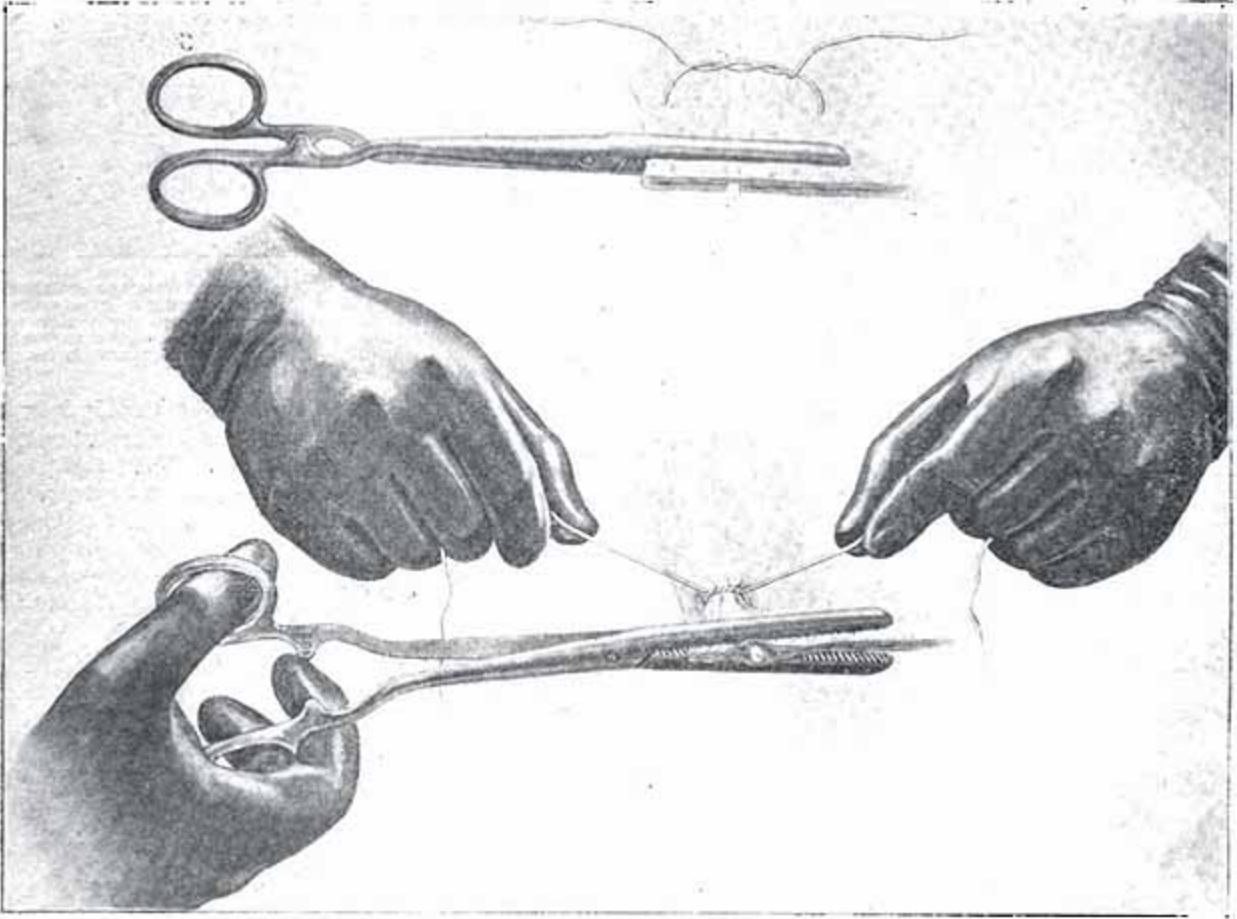


Fig. 5.—Supravaginal hysteromyomectomy. A ligature *en masse* surrounding an artery in the broad ligament is being drawn tight and tied; while the operator is tightening the ligature, the assistant is removing the forceps. If the ligature is drawn tight before the forceps are removed the artery will not be sufficiently compressed and hemorrhage may result.

scribed for supravaginal hysterectomy; the uterine arteries are usually clamped and tied a little further from the uterus. This necessitates the greatest care not to include the ureters, which cross the arteries near the uterus. The broad ligaments and circumuterine structures are then divided by means of strong scissors, as shown in the illustrations; in making the incisions for this purpose close to the uterus, no harm is done if, on either side, a small portion of the lateral walls of the cervix be left behind. The bladder is stripped away from the cervix as far toward the vagina as practicable and the peritoneum of the posterior wall of the uterus is stripped or dissected off in the same way.

If the vaginal incisions have previously extended into the pelvic cavity, the final removal of the uterus will

the vagina, and the entire anterior cervical wall is thus divided in a longitudinal direction. The finger now readily passes to the vagina, and serves as a guide for the rapid removal of the uterus by a circular incision around the cervix at the utero-vaginal attachment. In some cases it is convenient to reserve the ligaturing of the uterine arteries to this part of the operation. Small bleeding vessels are tied or twisted. If drainage is not required the wound should be closed complete both on the vaginal and the peritoneal side. This may be done by lines of union from side to side as shown in Figs. 10 and 11.

Fig. 12 shows the wound closed by end-to-end approximation of the broad ligaments. If this method is employed the same sutures that unite that part of the

broad ligaments nearest to the vaginal wound should also catch up the upper cut end of the vagina so as to draw it into the space from which the cervix has been excised and unite it to the broad ligament stumps at the point where the ligatures surround the uterine arteries; this serves to draw the vagina strongly upward and to cover the exposed surfaces between the vagina and broad ligaments.

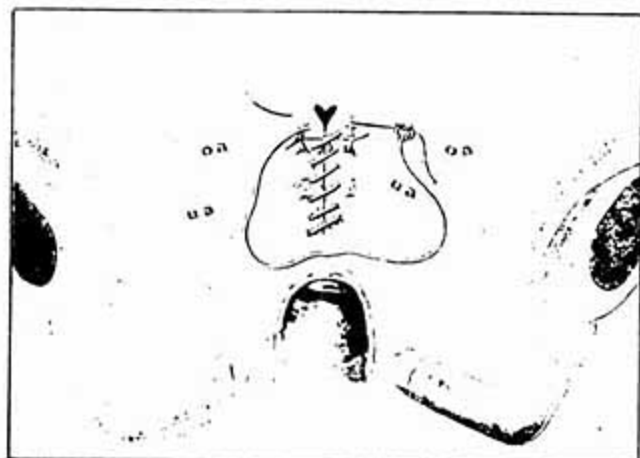


Fig. 7.—Supravaginal hysteromyomectomy. o a, o a, Ovarian arteries; u a, u a, uterine arteries; the continuous suture for end-to-end approximation of the broad ligaments nearly complete.

Upon completion of the operation the vagina should be packed with gauze from the vaginal wound to the vulva, and a large gauze dressing placed over the vulva to absorb the drainage fluid and held there by a T-bandage, which should be changed often to keep it dry; the vaginal gauze is removed in about three days and vaginal douches of 0.5 per cent. lysol are then given twice a day.

If drainage of the pelvic cavity is required, it should be vaginal, and the vaginal wound should be left

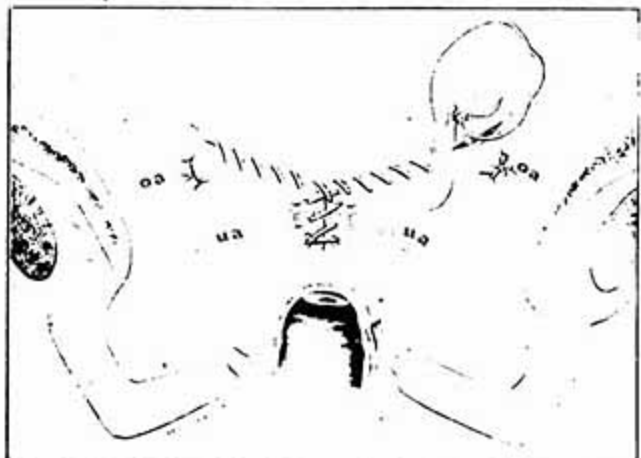


Fig. 8.—Supravaginal hysteromyomectomy. o a, o a, Ovarian arteries; u a, u a, uterine arteries. In the case represented by this figure the broad ligaments are too short for complete end-to-end approximation. The end-to-end approximation is therefore carried out only part way, but the ligament and the remainder of the closure is accomplished by a line of union running from side to side. The running suture is nearly complete.

open or partly open for that purpose. The drain is introduced as follows: the end of a long strip of gauze, double thick and two inches wide, is passed from the pelvis through the vaginal wound to the vulva; the gauze is then lightly packed from below upward so as to fill

the vagina and the vaginal wound, and to cover all surfaces in the pelvis left exposed by the operation. The dressing over the vulva which receives the capillary drainage from the gauze should be kept dry by frequent changing. The gauze drain, being a continuous strip, may easily be removed by the vagina in two or three days.

In hysteromyomectomy the ovaries, if normal or

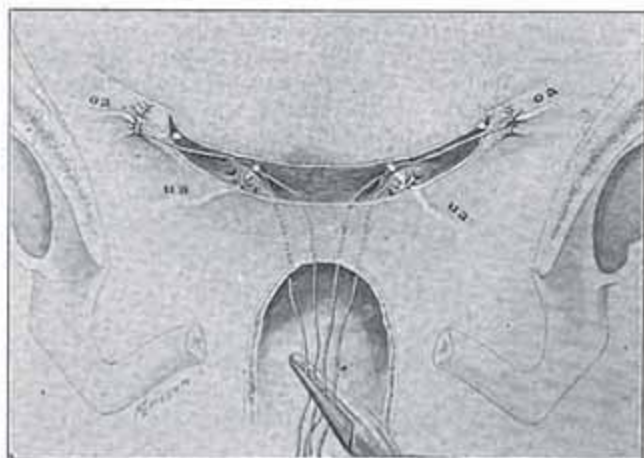


Fig. 10.—Complete abdominal hysteromyomectomy; entire uterus and tumor removed: long ends of catgut ligatures on ovarian and uterine arteries have been drawn down through the vagina to the vulva by a pressure forceps passed from the vagina through the vaginal wound, and then withdrawn with the ligatures in its grasp.

nearly normal, should be preserved. Catgut ligatures and sutures are used throughout. The ligatured part should receive nutrition by collateral circulation and all ligatures should be so introduced as not to deprive the ligatured tissues of circulation and nutrition. The proper method of applying the ligatures to the ovarian arteries as they pass through the broad ligament and to the uterine arteries as they reach the sides of the uterus is shown in the accompanying illustration.



Fig. 11.—Complete abdominal hysteromyomectomy. While the ligatured masses which contain the ovarian and uterine arteries are being held down into the vaginal wound by pressure forceps in the hands of an assistant, the operator is uniting by a continuous suture the peritoneal margins of the vaginal wound in such a way as to make the entire traumatism extraperitoneal. This suture may include and fix the ligatured masses and hold them below the line of union; it should also catch up and hold the upper cut end of the vagina in contact with the lower edge of the broad ligament.

Advantages of End-to-End Approximation of the Broad Ligaments in Hystero-Myomectomy.—1. The broad ligaments, when approximated by this method, take the place, in an anatomical sense, of the ex-

cised uterus and form a pouch posteriorly that corresponds to the cul-de-sac of Douglas and anteriorly a depression that answers for the utero-vesical pouch.

2. The broad ligaments, if brought together end to

3. The broad ligaments when brought together by end-to-end approximation, are interposed between the bladder and rectum and thus prevent the intimate union of these two viscera—a union that would leave a very

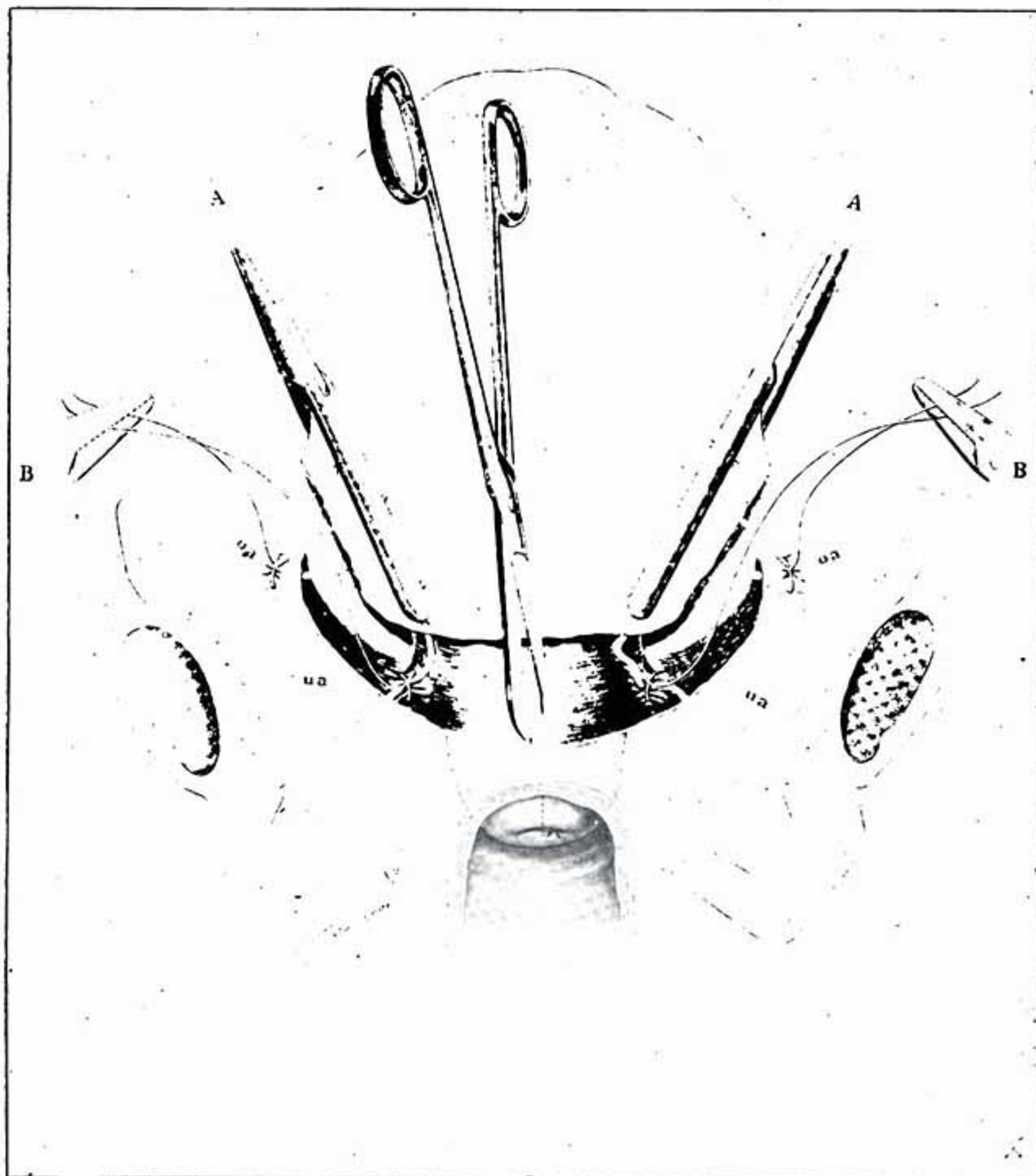


Fig. 9.—Complete abdominal hysteromyomectomy. The broad ligaments have been divided on either side of the uterus to the region of the uterine arteries; the circumuterine peritoneum has been divided by a circular incision around the cervix and together with the attached bladder stripped down toward the vaginal portion of the cervix. All clamps which were used to secure the uterine and ovarian arteries except those next to the uterus, A A, have been removed and permanent ligatures have been placed upon the ovarian and uterine arteries, o a., o a., and u a., u a. The anterior wall of the cervix is being split longitudinally by cutting through it with scissors from the pelvic cavity to the vagina. This is to facilitate the excision of the uterus as described in the text. The long ends of the ligatures on the ovarian and uterine arteries are held out of the way by means of forceps B B.

end, give support to the rectum, vagina, bladder and other parts of the pelvic floor and in so doing prevent the descent of those parts—a descent which so commonly results from hysterectomies as ordinarily performed.

thin wall between them through which infection might pass from one to the other.

4. The operation is more quickly and easily performed by this method than by that of side-to-side union of the ligaments.

I have united the ligaments by end-to-end approximation often enough to be convinced of the feasibility and utility of the operation.

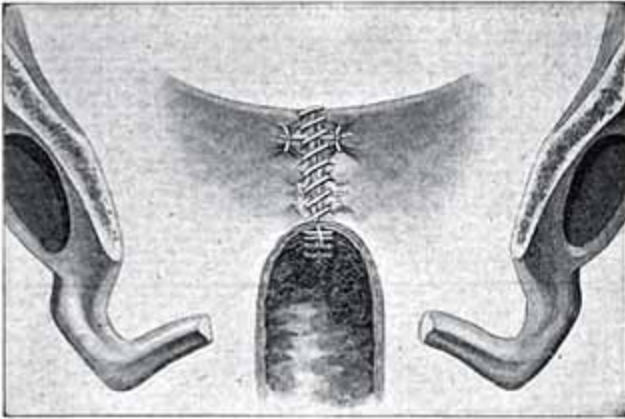


Fig. 12.—*Complete abdominal hysteromyomectomy.* The broad ligaments are brought together from side to side and united by end-to-end approximation. The upper extremity of the vagina is also closed by suture introduced from side to side so as to fasten it to the lower part of the broad ligament wound at the point where the ligatured uterine arteries are approximated.
