7

Enucleation of a Fibroid from the Vagina

The removal of a submucous fibroid is not discussed in this chapter, since this is not an abdominal operation. If a fibroid has already emerged from the external os, or if it is ready to be "delivered" or if it still lies in the cavum of the uterus, its removal is easy, even if it is necessary to dissect the bladder from the cervix as a preliminary step for the division of the anterior wall of the cervix in order to make the tumor accessible.

Fibroids of the cervix are not discussed here either since very often their removal can be accomplished without opening the peritoneum. However, occasionally, in removing larger tumors the peritoneal cavity might be opened unintentionally at its distal end.

The fibroids of the neck of the uterus are most suitable subjects for a vaginal operation. These lie in direct contact with the vagina and, therefore, are easily reached from down below. In this operation we first cut through the vagina and then dissect the bladder away. A fibroid that is located anteriorly and laterally can be easily grasped with a tenaculum and a major part of its surface freed either by the finger or by blunt dissection with a closed scissors (Fig. 68). Injuries to adjacent organs are practically excluded, provided that one keeps close to the borders of the fibroid. Cervical fibroids are almost without exception singular. The wound bed resulting from their removal is rather small, and there is hardly any bleeding from it of any intensity. If vessels of any remarkable size are encountered they are ligatured, and the wound bed is covered with some gauze which is conducted out of the vagina. According to the size of the wound bed, the drainage gauze is left in place for a longer or a shorter period and is shortened every day. If a larger cervical fibroid is enucleated by laparotomy, it can happen, particularly if it protrudes to a large extent into the cervical tissue proper, that the remaining part of the cervical tissue is very thin, leaving behind a very loose connection with the uterus body. In such cases, from a technical point of view, it is advisable to extirpate the body entirely. In a vaginal operation the uterus always can be saved, since there are no difficulties in taking care of the wound.

The main subjects of this chapter are the subserous and the intramural fibroids. Not every fibroid is suitable for a vaginal conservative operation. Solitary tumors originating from the anterior wall of the uterus are the most suitable ones. The size of the tumor is not so important. The vaginal enucleation can be attempted even in the presence of 2 to 3 solitary tumors; however, the operation may become more difficult if there are more than 3 tumors to be dealt with. In these cases the abdominal approach would be the operation of choice. If the tumors are close to each other it is advisable to use the initial incision of the enucleation as a starting point for the enucleation of the remaining fibroids and to avoid fresh incisions on the surface of the uterus. The tumor beds usually can be easily taken care of from the initial

incision, and there will be only one incision on the surface of the uterus that needs suturing.

Fibroids of the posterior wall are less suitable for a vaginal operation, the reason being that the surface of the detachment cannot be taken care of except with a suture. This suture obviously will have to remain in the abdomen and might give rise to adhesions and also to a fixation of the uterus in retroverted position.

If we have to deal with a fibroid in the anterior wall, we start with a midline colpoceliotomy and visualize the tumor by using some specula. If it is a subserous tumor (Fig. 69) it can be easily pulled down into the vagina through the colpoceliotomy and be cut off, or, if it has taken greater dimensions, it is grasped with a tenaculum and drawn toward the colpoceliotomy opening. A morcellation follows, and the remaining part is dislocated into the vagina (Figs. 70 and 71). Usually the uterus body will go with this procedure. Next, observing the proper precautions, the pedicle is severed and sutured (Fig. 72).

Intramural spheroid tumors require an incision at their most prominent point. They are grasped in a tenaculum first, and after a vertical incision is made through the wall of the uterus the tumor is reached at once. It is grasped with 2 tenacula (Fig. 73) and, if not too big, is shelled off its capsule; by using a closed curved scissors between the capsule and the fibroid proper and applying a strong pull, the tumor is detached from the capsule. Tumors of larger size require a cuneiform excision with the morcellation knife. Prior to the detachment of the spheroid tumor, a tenaculum is hooked into it in order to prevent its slipping back. This procedure is performed gradually, always taking care that the morcellation is done not in the capsule but in the tumor itself (Fig. 74). If the tumor is removed, the uterus wall is grasped with a tenaculum. If there are more fibroids present, we try to grasp them, one after the other, and by using the initial incision pull them out individually by dividing the capsule of each tumor separately. The wound bed is taken care of after all the tumors have been removed. This can be done in two ways. If the wound bed is small, it is covered by buried sutures and a simple row of surface sutures on the anterior wall of the uterus. The bladder peritoneum is fixed on top of the suture line and sutured into the anterior wall of the vagina, thus looking into the lumen of the vagina (Fig. 72). The colpotomy incision is reduced by sutures, and a small gauze is inserted for drainage purposes. If the wound bed is bigger than usual, and there are difficulties in controlling the bleeding, the procedure is somewhat different (Fig. 75). In these cases, the bladder peritoneum is fixed to the upper margin of the incision (Fig. 76), the left part of the enucleation wound is sutured to the left vaginal incision, and the right part is sutured to the right vaginal incision (Fig. 77). The wound bed itself is stuffed with gauze, and the gauze is led out of the vagina. The vagina is resutured above and under the fixed incision. This is the safest and best way to take care of the wound bed after an enucleation of a fibroid of any major size. We have had the occasion to observe normal pregnancies and deliveries after such operations (Fig. 78).

The treatment of fibroids that are located in the posterior wall of the uterus body is more difficult. If a bimanual examination has verified the diagnosis, the best approach for this kind of fibroid would be the laparotomy for the simple reason that these fibroids are difficult to reach by the vaginal route. This is important, because it would be hard to provide the necessary attention to the wound

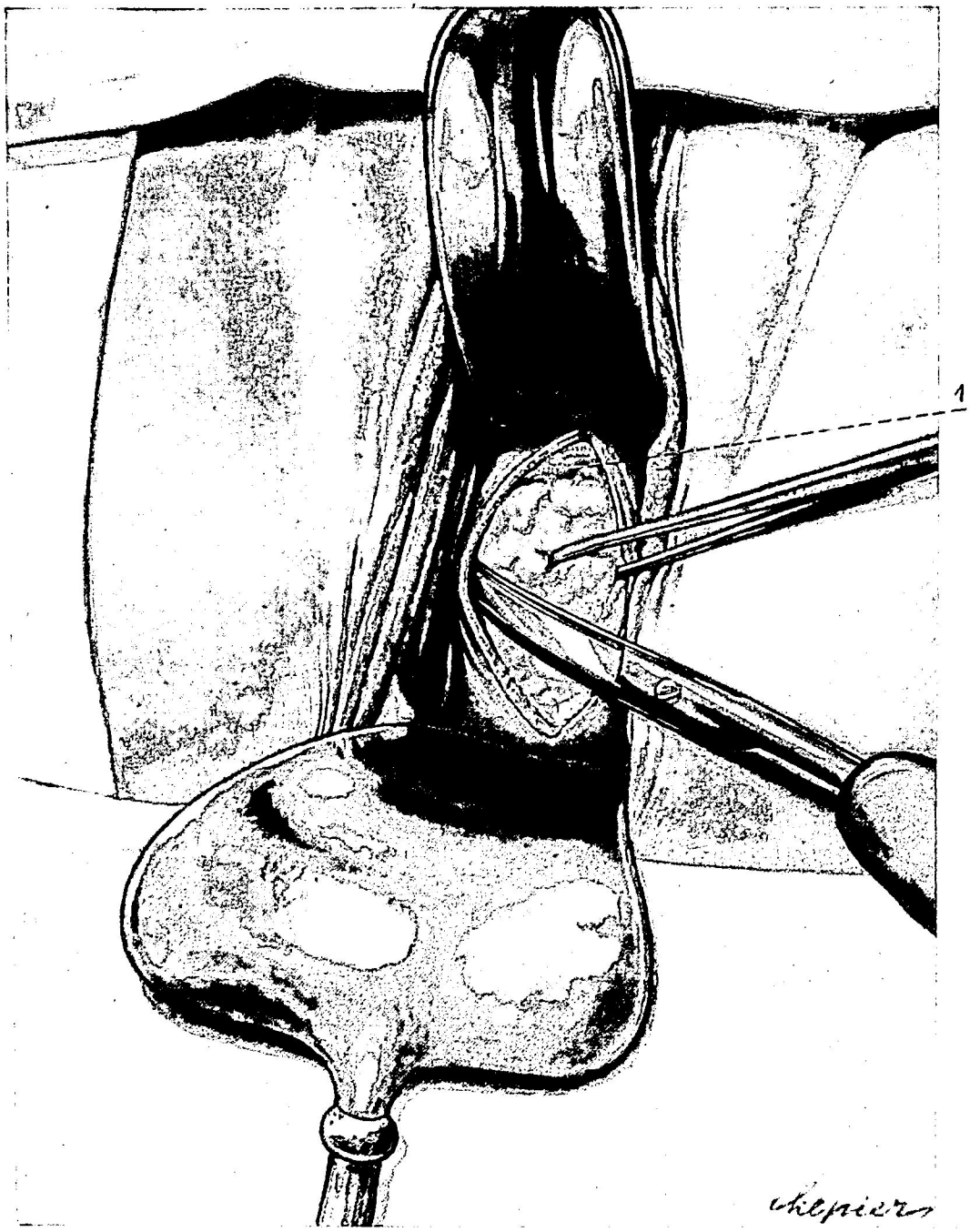

FIG. 68. The fibroid is situated in the anterior wall of the cervix below the bladder. The anterior wall of the vagina is incised in the mid-line which exposes the fibroid. It is grasped in a tenaculum, pulled forth and enucleated from its bed with the closed branches of the scissors. (1) The bladder.

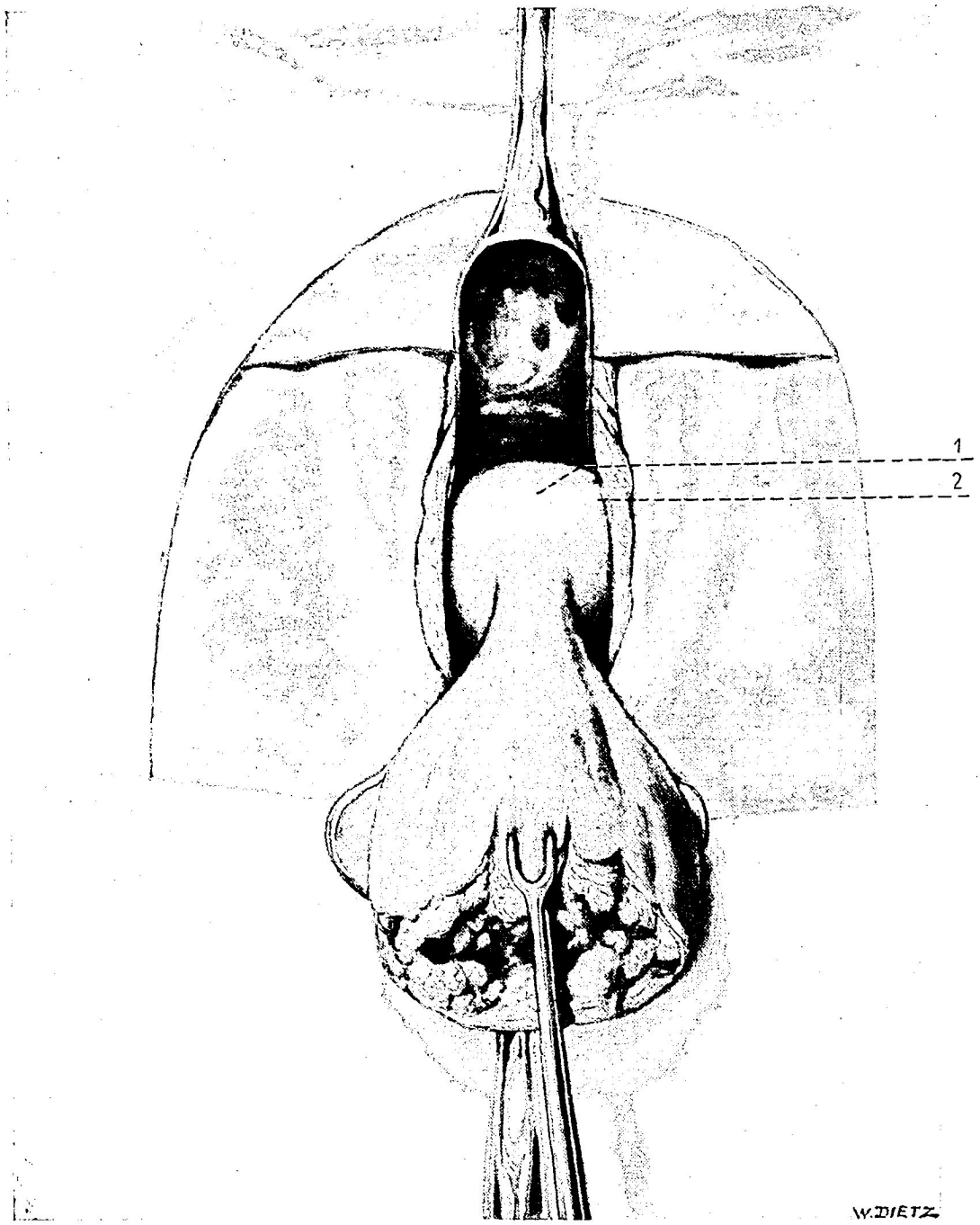

FIG. 71. The rest of the fibroid is drawn in front of the vulva. The body of the uterus appears in the vagina. (1) Fundus of the uterus. (2) Junction of the left adnexa.

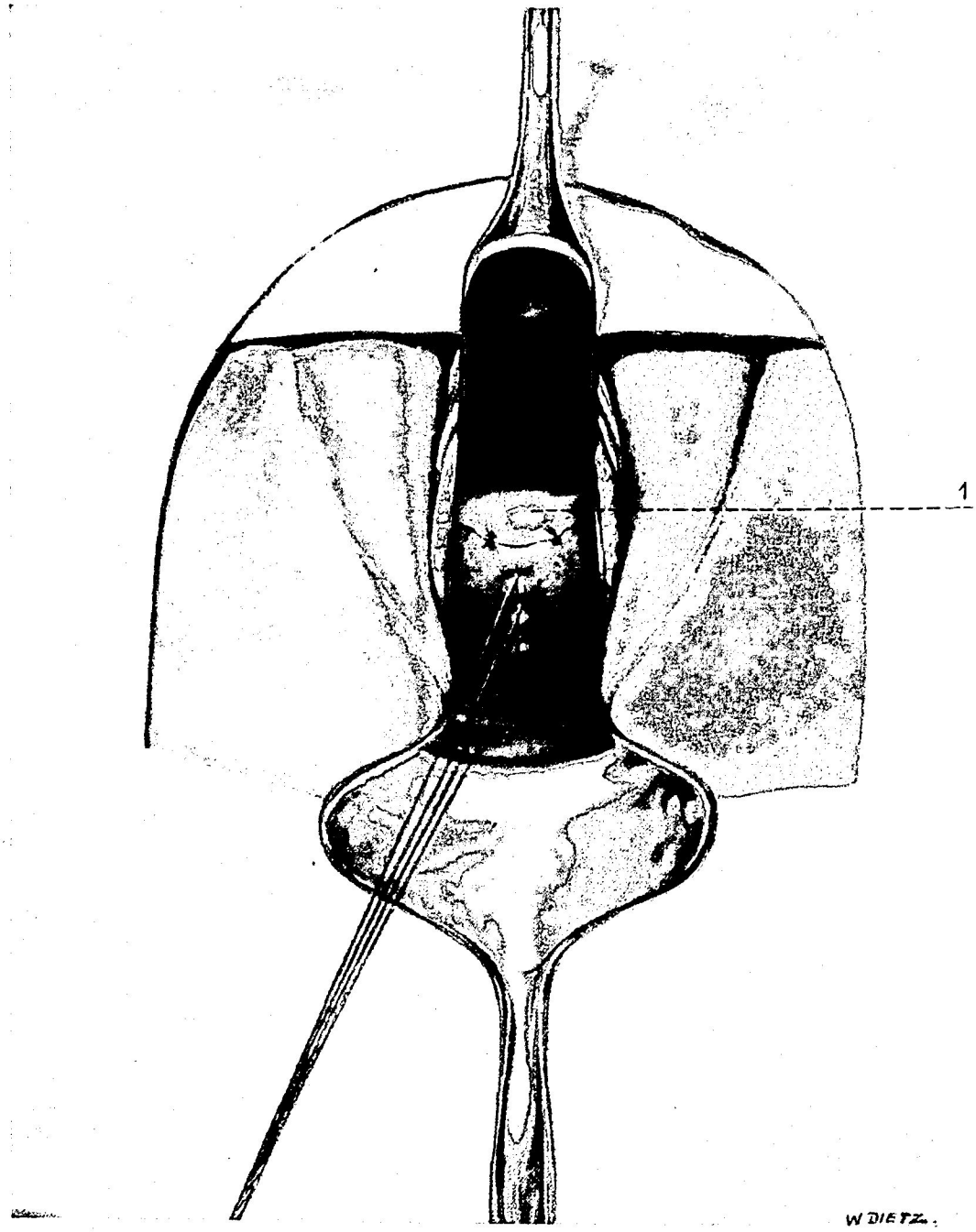

FIG. 72. The place of the resected pedicle has been sutured carefully, and the bladder peritoneum has been sutured above it. (1) Bladder peritoneum.

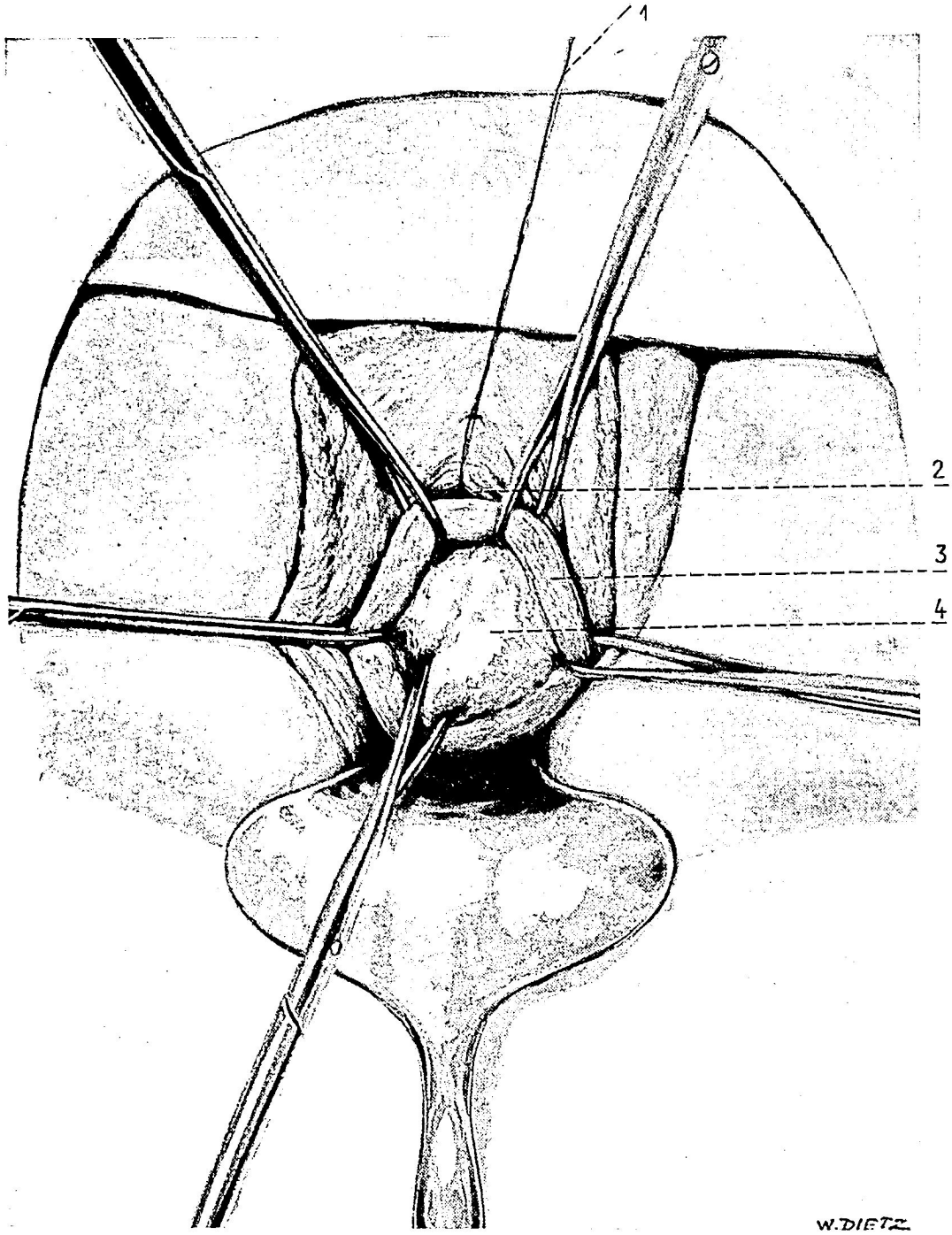

FIG. 73. The wall of the uterus has been incised vertically over an intramural fibroid. The fibroid is grasped in a tenaculum and pulled downward. (1) Rein on the bladder peritoneum. (2) Upper end of the colpotomy. (3) Wall of the uterus. (4) The fibroid.

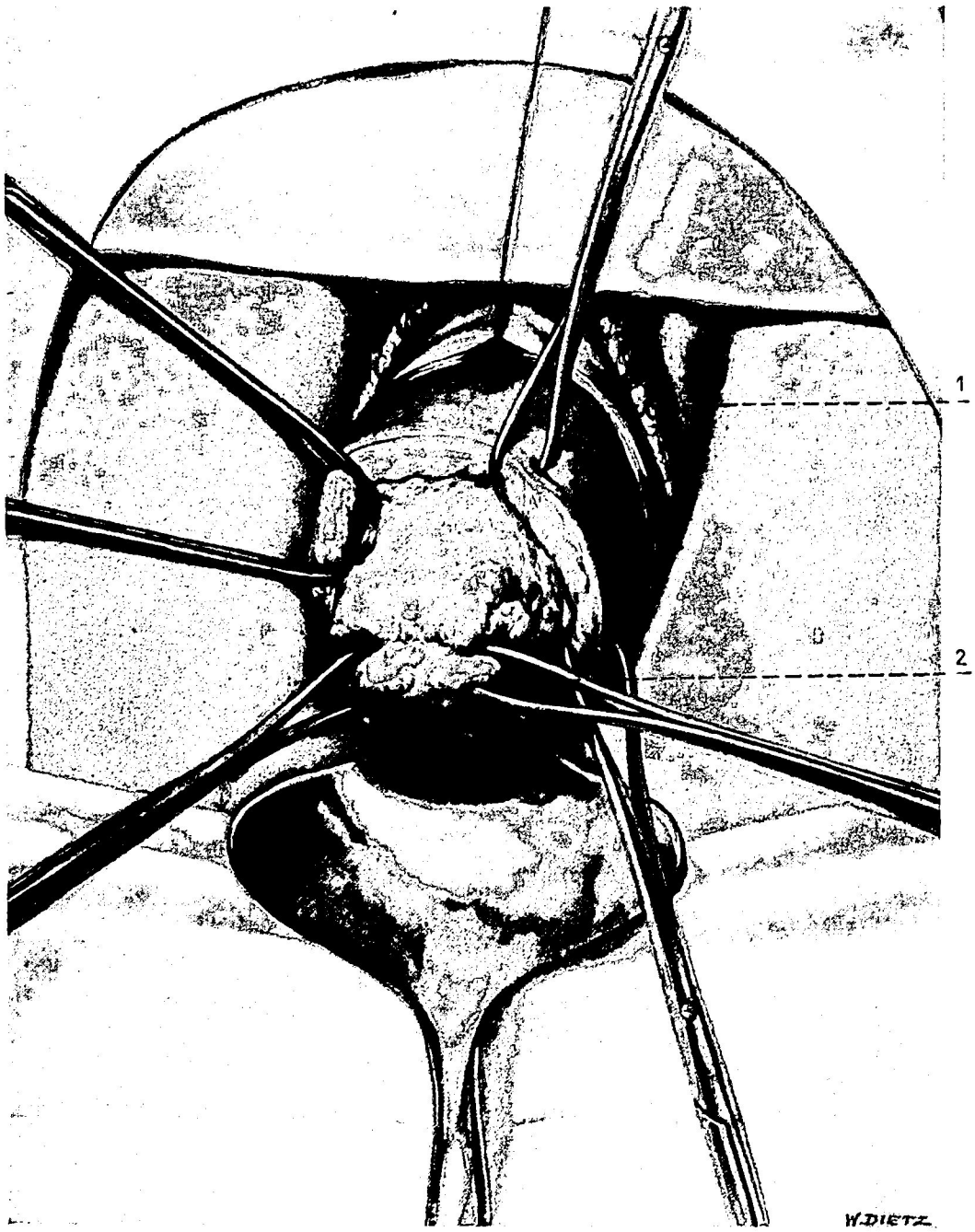

FIG. 74. The lower portion of the fibroid has been resected by morcellation. The upper part is drawn forth. (1) Junction of the left adnexa. (2) Wound bed following morcellation of the lower portion of the fibroid.

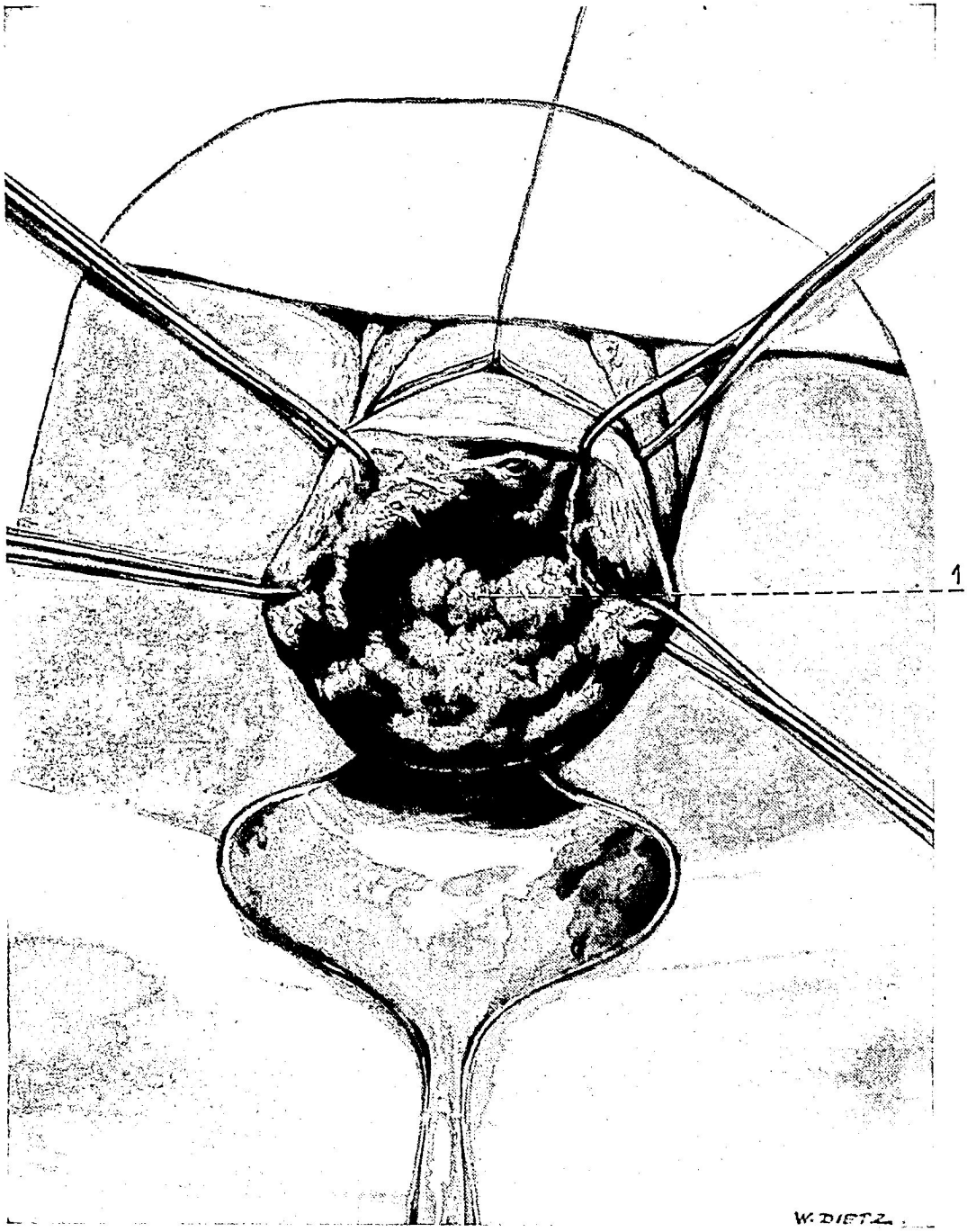

FIG. 75. The fibroid has been removed entirely, and the wound bed is drawn apart. (1) The wound bed.

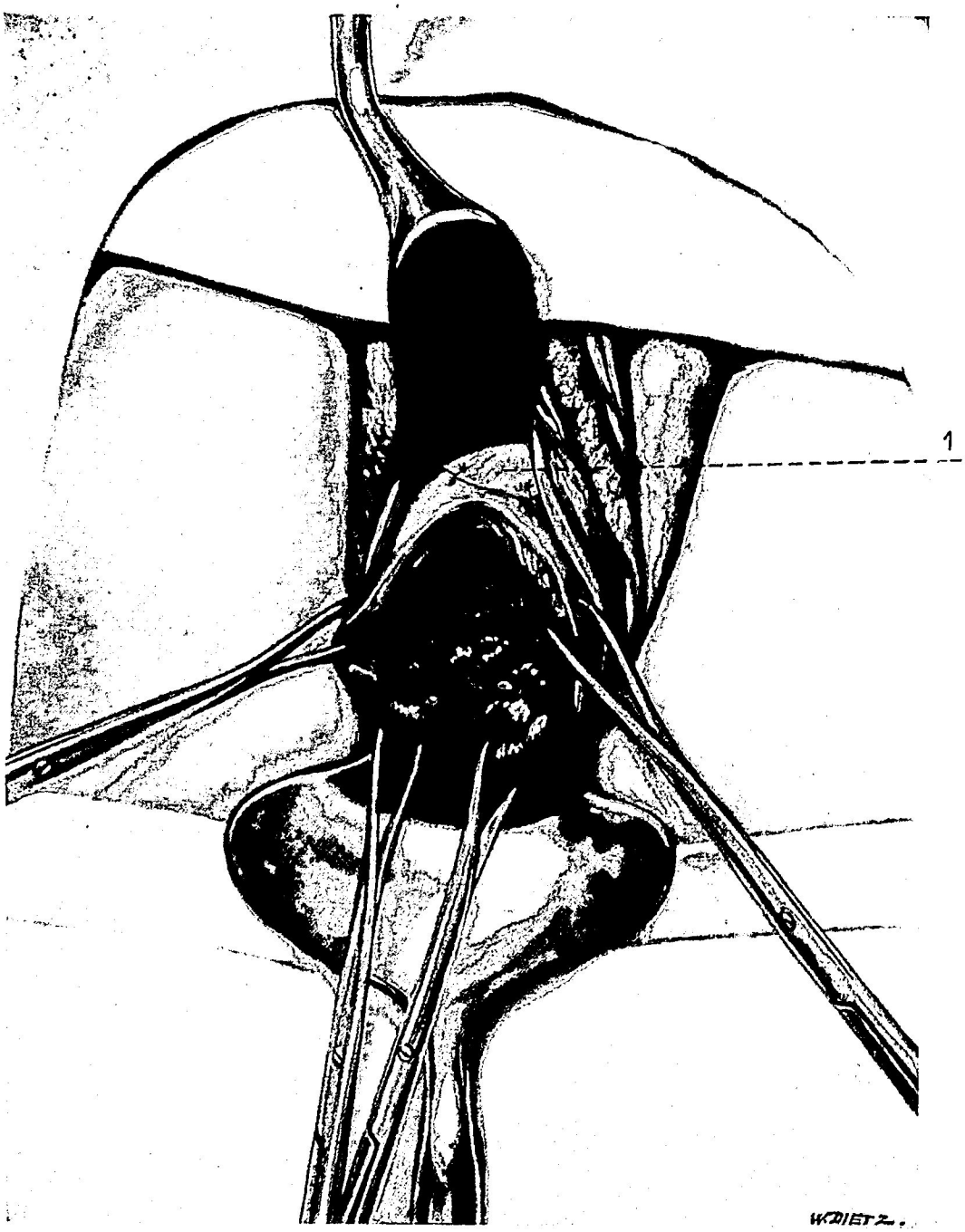

FIG. 76. The bladder peritoneum is sutured above the wound bed; the wound bed itself is pushed back. (1) Peritoneum of the bladder.

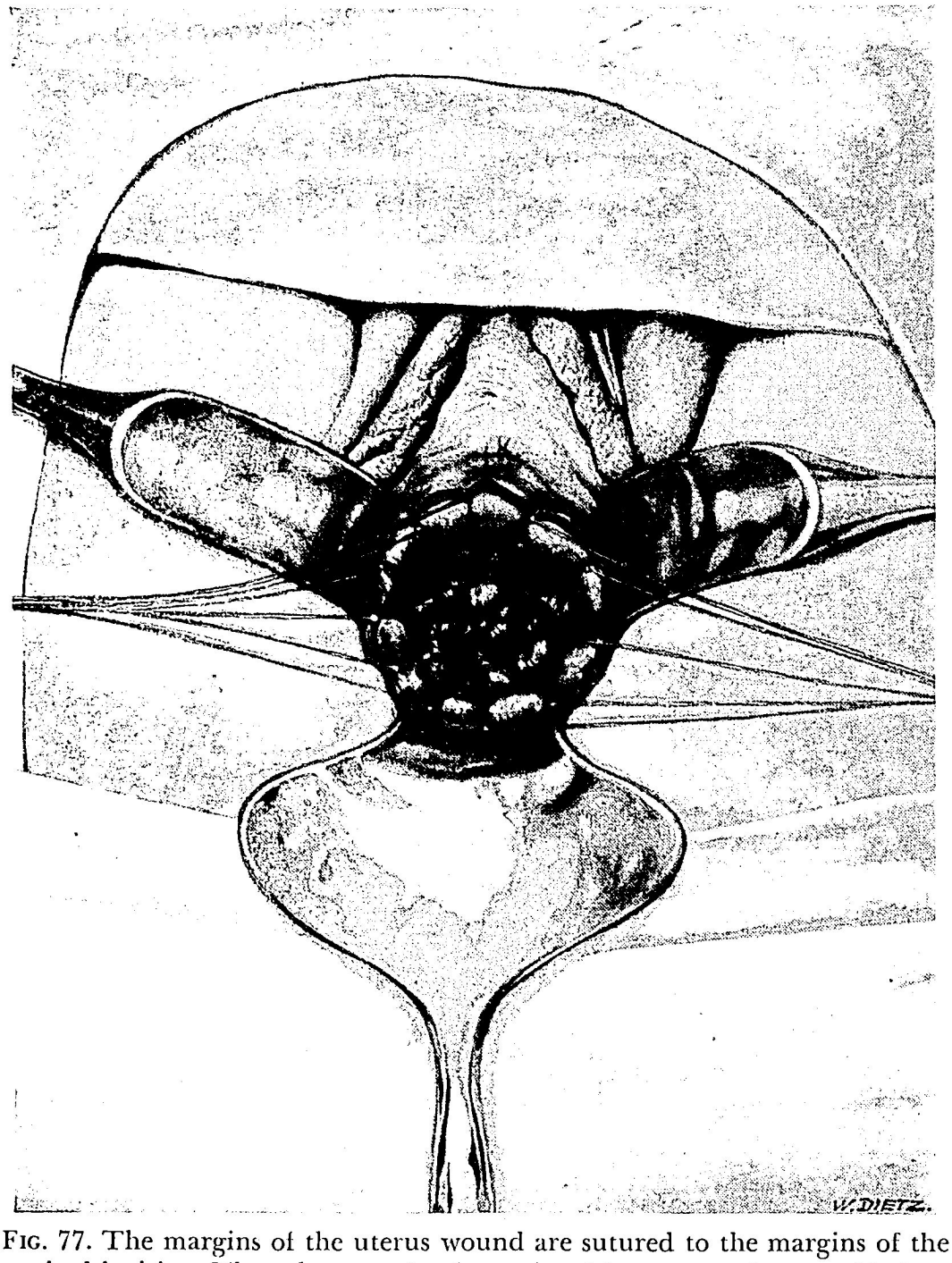

FIG. 77. The margins of the uterus wound are sutured to the margins of the vaginal incision. The colpotomy has been closed by sutures above and below.

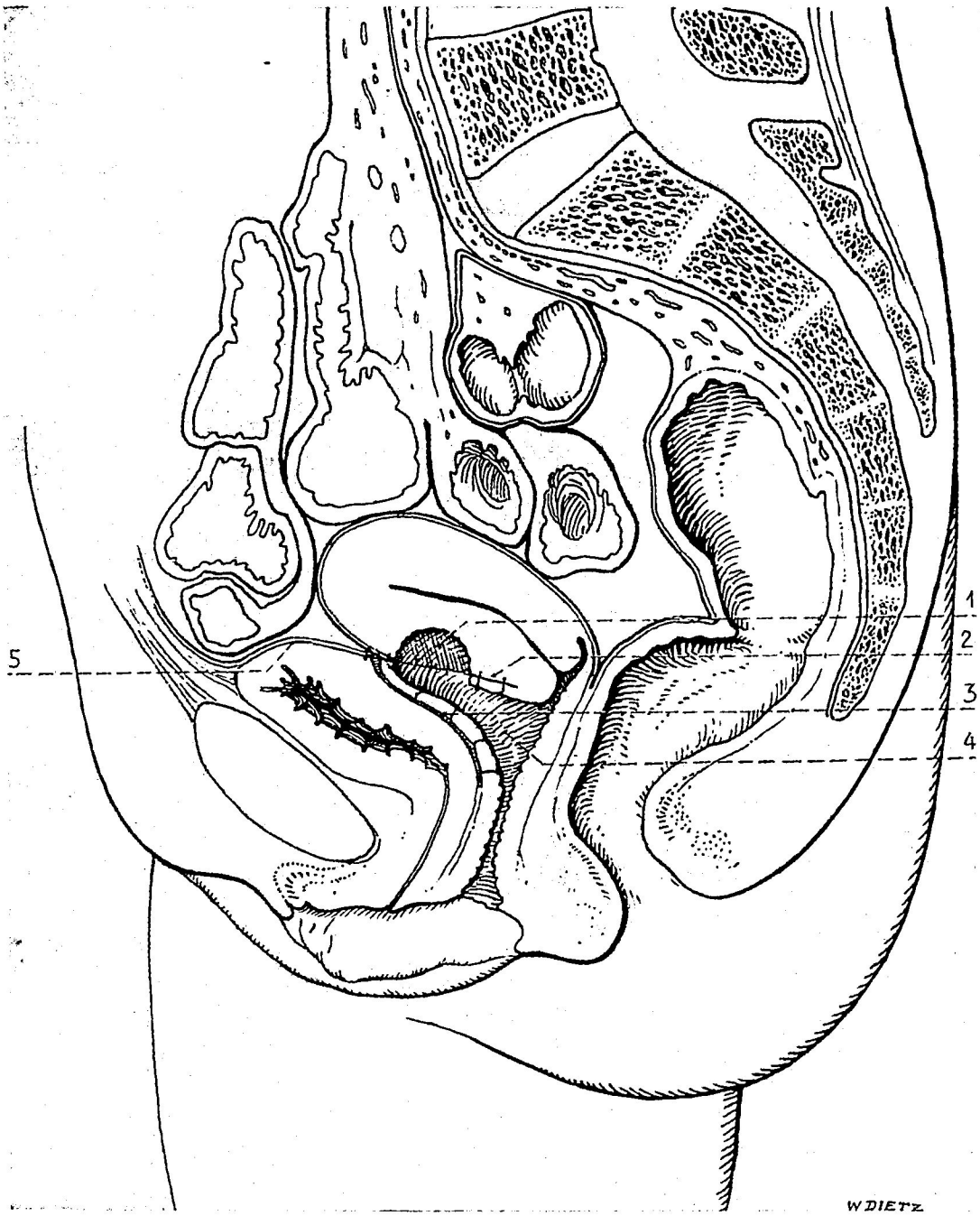

FIG. 78. This schematic vertical cut of a pelvis may render a better understanding of the way the wounds have been taken care of following the operation described. (1) Bed of the fibroid. (2) Part of the colpotomy. (3) Part of the colpotomy close to the urethra. (4) The vagina. (5) Peritoneum of the bladder.

bed. However, if by chance a vaginal operation was started, there is no reason why even these fibroids should not be enucleated from the anterior celiotomy. The requirements for a successful operation are a rather good mobility of the uterus and a wide elastic vagina which will permit the uterus to be rolled out in front of it. If this is done, the uterus wall is incised on top of the tumor. The ensuing steps follow the pattern of the operation for tumors in the anterior wall (Fig. 79). The wound bed needs proper attention, particularly as far as bleeding is concerned. When the uterus becomes dislocated anteriorly, the vessels are twisted and elongated, which interferes with the circulation. However, when the uterus returns to its original position, the circulation also returns to normal, with the result that occasionally a hematoma cannot be avoided. If the vagina is large, very often the omentum might protrude in front of it. This would require a resection of the prolapsed part and the suturing of the surface of the wound (Fig. 80). This will provide a safe protection against complications and will prevent adhesions. In any case, an anterior fixation of the uterus to the anterior wall of the vagina will have to complete the operation for enucleation in order to prevent the development of a retroversion. If there is any doubt about a safe hemostasis, it is advisable to arrange for a drainage through the posterior fornix.

An operation from the posterior celiotomy is not advisable, since the uterus would have to be placed in extreme retroversion, by which all the vessels would suffer a greater twisting and stretching than would result from an anterior procedure. A pedicled subserous singular fibroid of the posterior wall of the uterus would justify a posterior celiotomy approach.

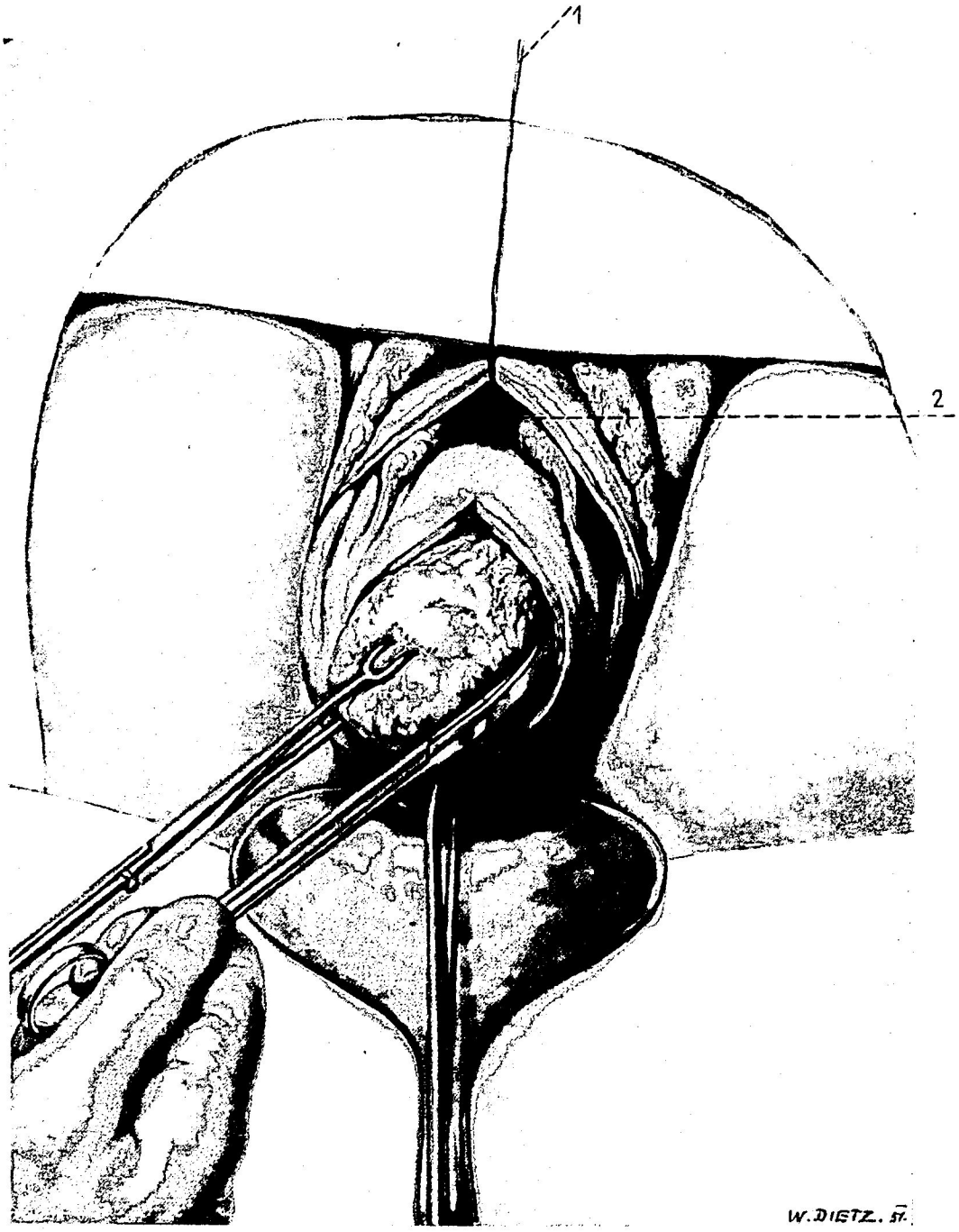

FIG. 79. An intramural fibroid of the posterior wall of the uterus is being enucleated through an anterior colpotomy. (1) Rein on the bladder peritoneum. (2) Cleavage of the anterior colpotomy.

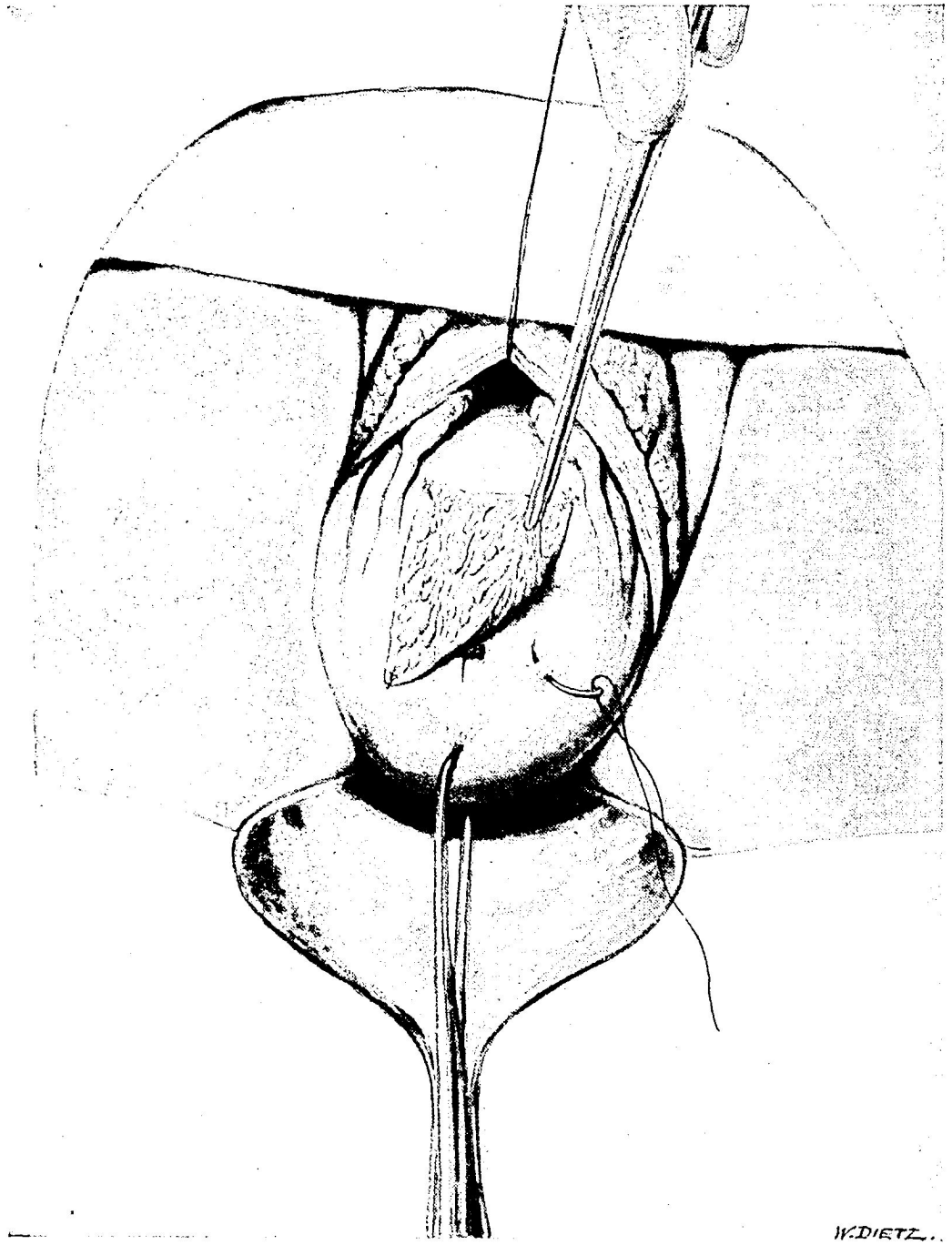

FIG. 80. The sutured wound is being covered with a flap of the omentum that has been gained by an anterior colpotomy.

8

Extirpation of Ovarian Cysts by the Vaginal Route

Ovarian cysts are most suitable subjects for the vaginal operation, provided that they are selected most carefully. Special attention is required for a correct diagnosis. Adherence to these rules makes the vaginal operation for a cyst the most correct, the quickest and the safest procedure available.

Only cystic tumors are to be subjected to this operation, since in solid tumors the possibility of a malignancy cannot be excluded, which per se makes them no object for a vaginal operation. The contents of the cyst has to be watery and not mucinous, as this would not empty through a trocar. We recognize a watery content by the smallness of the cyst, its spherical shape and its smooth surface. In cysts of major size we can easily feel fluctuation on bimanual examination. The size of the tumor is no contraindication because it can be reduced by puncture. The cystic sac can be finally pulled out from the vaginal incision. Even multilocular cysts are operated vaginally. They can be visualized and punctured individually, one after the other. An important factor is complete mobility. There must be no intraligamentary developments, no adhesions and no incarcerations. The last is of rare incidence. We recognize an intraligamentary development by the fact that the tumor is lacking a pedicle but rests more or less broadly at the pelvic wall. Furthermore, such an intraligamentary tumor will strongly displace the uterus to the opposite side, and it is closely connected with the fornix of the vagina. Occasionally, the pulsation of the uterine artery may be felt from the lateral part of the fornix. It would not be wise to treat vaginally a wound resulting from the separation and the detachment of such a cyst from the pelvic wall. Therefore, we consider fixation of a tumor by adhesions to be a contraindication to its removal by the vaginal route. Even if the adhesions could be separated, an exact hemostasis could not be safeguarded, and there is no doubt that parts of these adhesions would have to be left behind in order to avoid major complications. The mobility of a giant cyst, with its distal pole near the processus ensiformis, is very difficult to prove and can only be assumed by a complete lack of spontaneous or pressure pains or when the position of the patient is changed. It is the enormous enlargement of the abdomen that leads such patients to a doctor's office.

Dermoid cysts also should be excluded from a vaginal operation. They cannot be emptied by the trocar, and if this is attempted part of the contents might easily enter the abdominal cavity through the vaginal incision. This would drop into the Douglas pouch and give rise to the formation of exudates and abscesses. A dermoid cyst can be diagnosed by its location in front of the uterus, by its oblong shape and by its pasty consistency. However, if the diagnosis is made after

the operation has been started, it is suggested that the Douglas pouch be opened on completion of the operation and drained with a rubber T-drain, which can be removed after a few days. This will permit the escape of such parts of the cyst as might have accumulated there.

Admitting that the differentiation of the various types of ovarian tumors is difficult, the recognition of whether a tumor originates from the ovary at all can be even harder if tight or obese abdominal walls are hindering the examination. Especially difficult is the differentiation between a cyst and a spheroid fibroid. Weibel has recommended the following diagnostic aids. He puts his left hand into the area, applying some pressure above the symphysis, and pushes the tumor upward, while with the index finger of his right hand he feels the cervix. If, by the described pushing-away movement, the cervix also follows upward, proof is given that the tumor belongs to the uterus. If it is an ovarian tumor, the cervix will remain in its place, since the tumor is independent from the uterus and has no direct connection with the cervix. However, if the tumor is a subserous fibroid with a long pedicle, this procedure might fail. In such cases, the presence of a number of small fibroids which can be felt in the substance of the uterus might help in the establishment of the diagnosis.

Once the diagnosis is secured, the operation will run as follows. An anterior mid-line colpoceliotomy is made. If we have to deal with small or average size tumors, we use a delicately built hooked instrument, by which we proceed up the anterior surface of the uterus until the horn of the side where the cyst is located is reached. Next, the pedicle, or, if possible, the ligamentum ovarii proprium alone, is grasped in a forceps, and the tumor, with a gentle pull, is brought into view. In order to do this, the body of the uterus must not be dislocated but must be shifted to the opposite side within the abdominal cavity. As soon as the tumor is visualized, it is pierced with a sharp scalpel (Fig. 81), which empties the contents in a watery, thin flow. It is best to avoid using a trocar because it might slip if the tumor is somewhat small. It is reserved for cysts of larger size. If the cyst is gigantic, we should avoid proceeding up the anterior wall of the uterus with the hooked instrument. Instead, we should avail ourselves of 2 long specula that are introduced into the peritoneal cavity; using some outside pressure, the tumor is pushed into the pelvic inlet. The patient is in the Trendelenburg position, which, by simple gravitation, permits the intestines to fall back toward the diaphragm. The distal pole of the cyst which is being attached to the pelvic inlet can now be visualized very well by using 2 specula (Fig. 82), and it is punctured with the trocar (Fig. 83). If for some reason the visualization cannot be accomplished, the trocar is conducted to the lower pole by 2 fingers which are introduced through the celiotomy, and the puncture is made in this way. After the cysts, regardless of their number, are emptied, the sacs are pulled out in front of the vulva (Fig. 84), and the pedicle is divided. From 1 to 3 clamps are needed for this, according to the thickness of the pedicle (Figs. 85 and 86). The clamps are replaced by ligatures, and the threads are allowed to remain long. Next, the bladder peritoneum is fixed to the uterus behind the stumps, and the stumps are sutured to the vaginal wall, using the aforementioned threads (Fig. 87). The vaginal incision is reduced in size, a gauze is introduced into a little hole (Fig. 88), and the gauze is removed after 24 hours.

The fixation of the stumps out of the

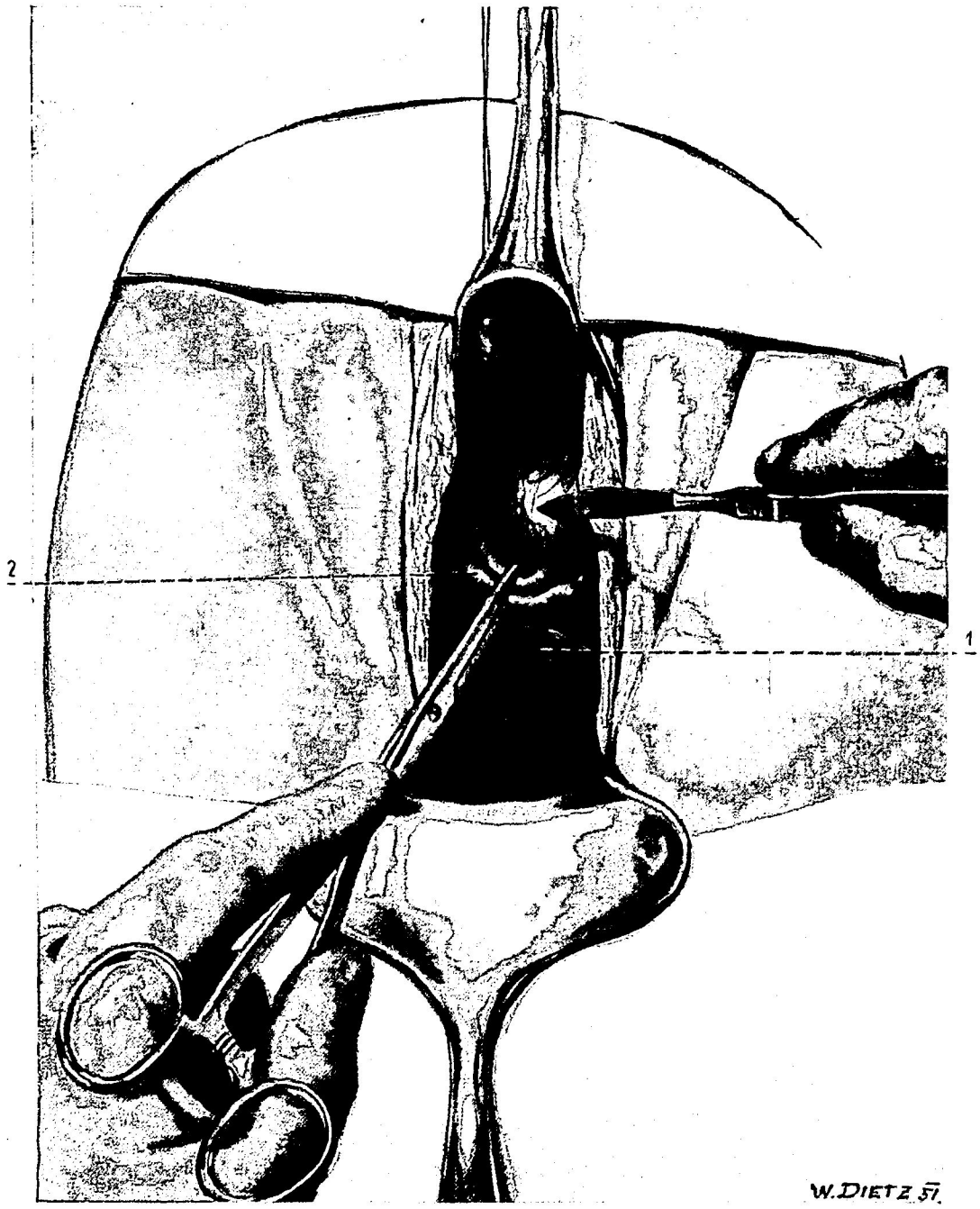

FIG. 81. A pull on the pedicle of the adnexa in a clamp brings the cyst into view. It is pierced with a fine scalpel. (1) Right vaginal flap. (2) Pedicle of the left adnexa.

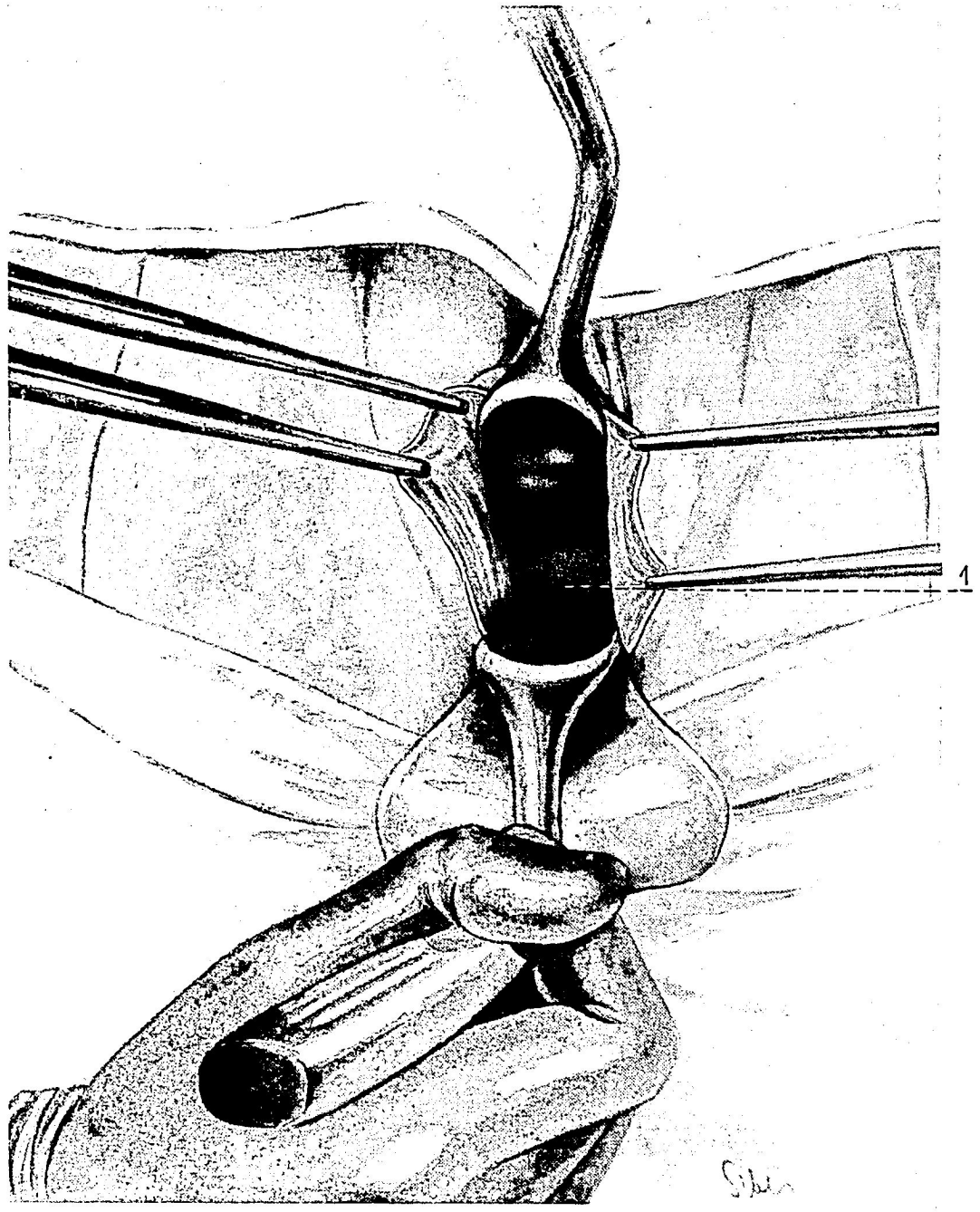

FIG. 82. Anterior mid-line colpotomy. The lower pole of the cyst is visualized by 2 anterior retractors. (1) Lower pole of the cyst.

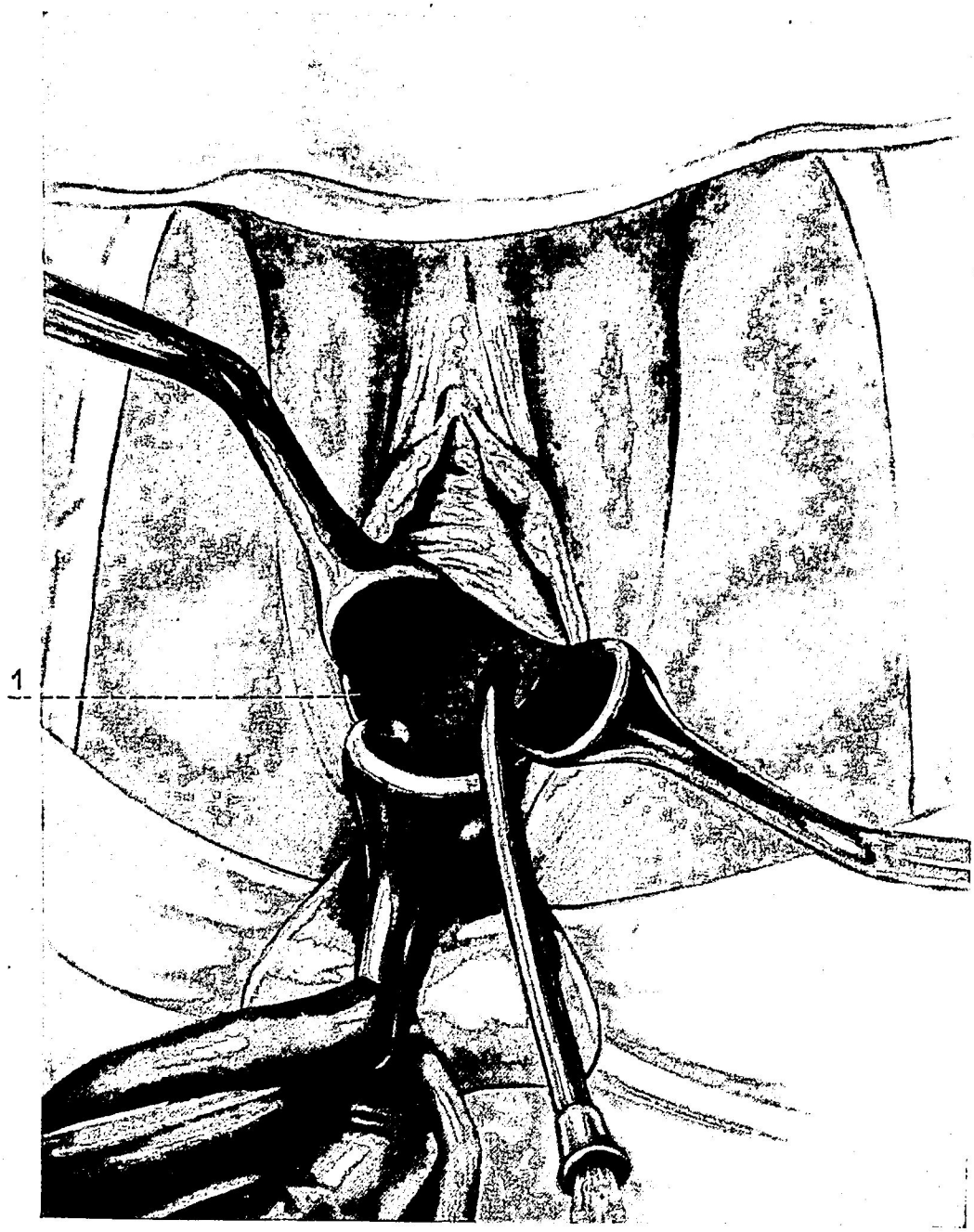

FIG. 83. The cyst is punctured with a trocar. The thin fluid of the cyst is emptied. (1) Inner lining of the right vaginal flap.

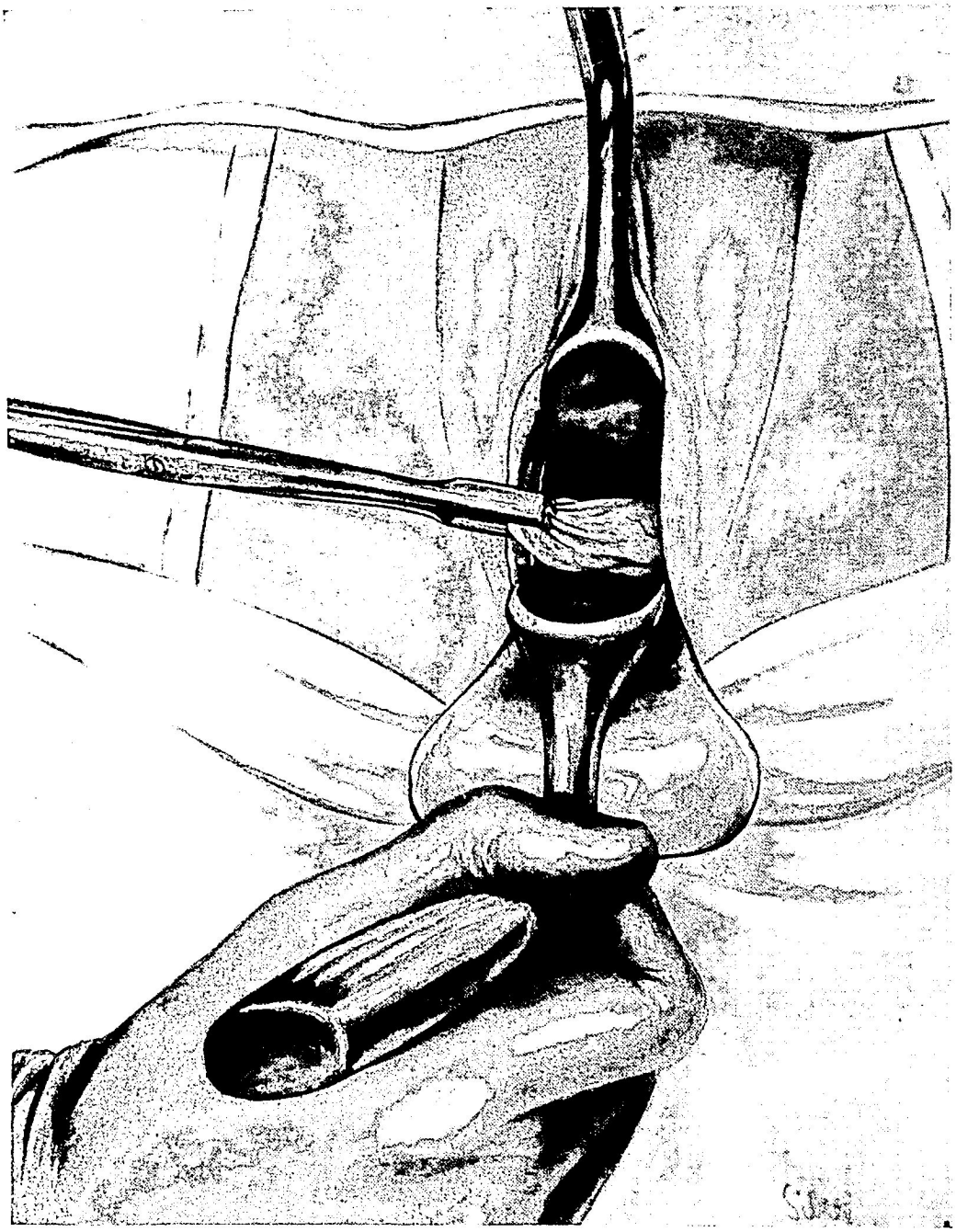

FIG. 84. The empty cyst sac is grasped in a forceps.

FIG. 85. The sac of the cyst is drawn before the vulva in its entire length. The right infundibulopelvic ligament is severed in a curved clamp. Another clamp is applied at the large pedicle of the cyst.

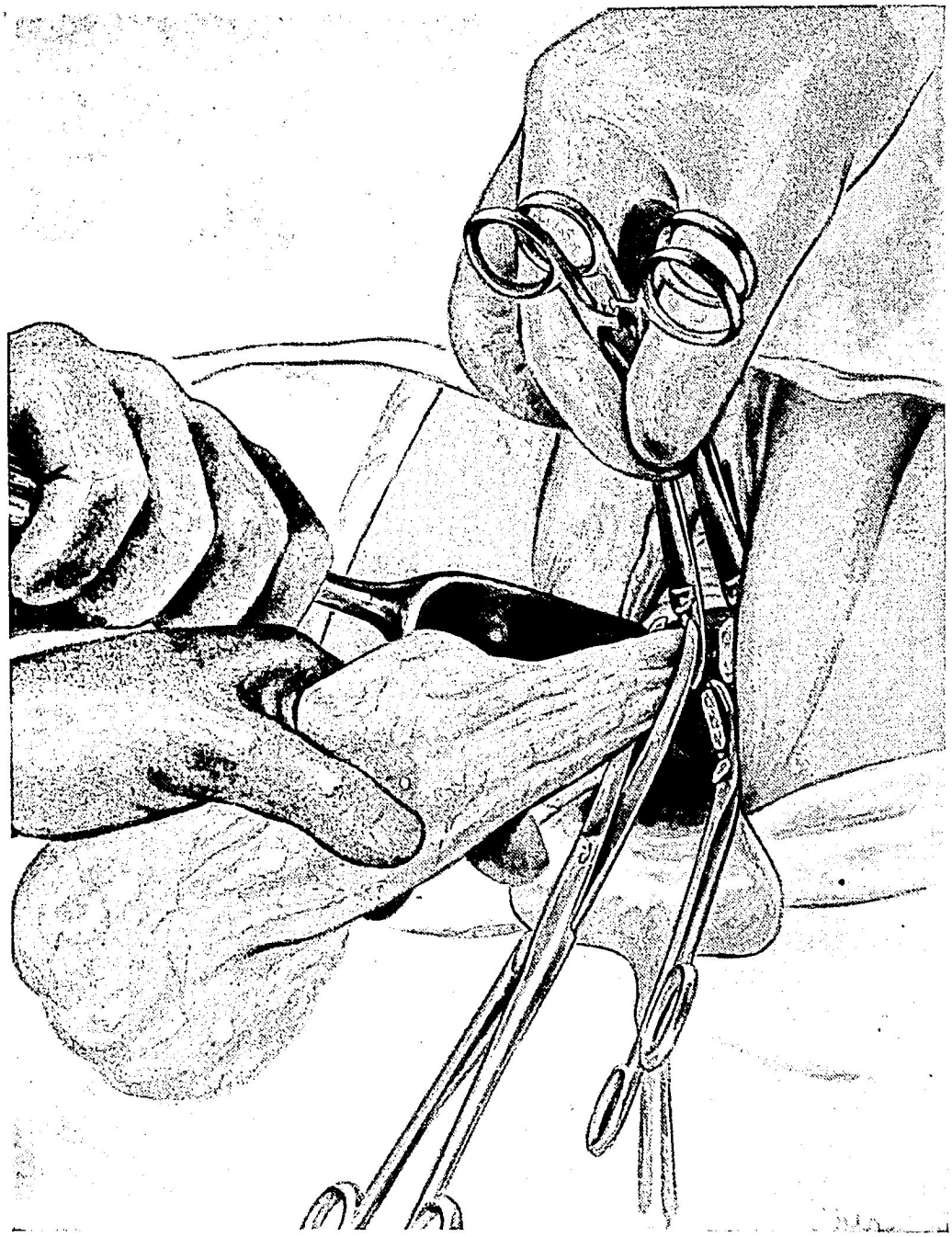

FIG. 86. The size of the pedicle requires the application of 3 clamps. The 2nd clamp is shown in a downward direction; the rest of the pedicle is severed.

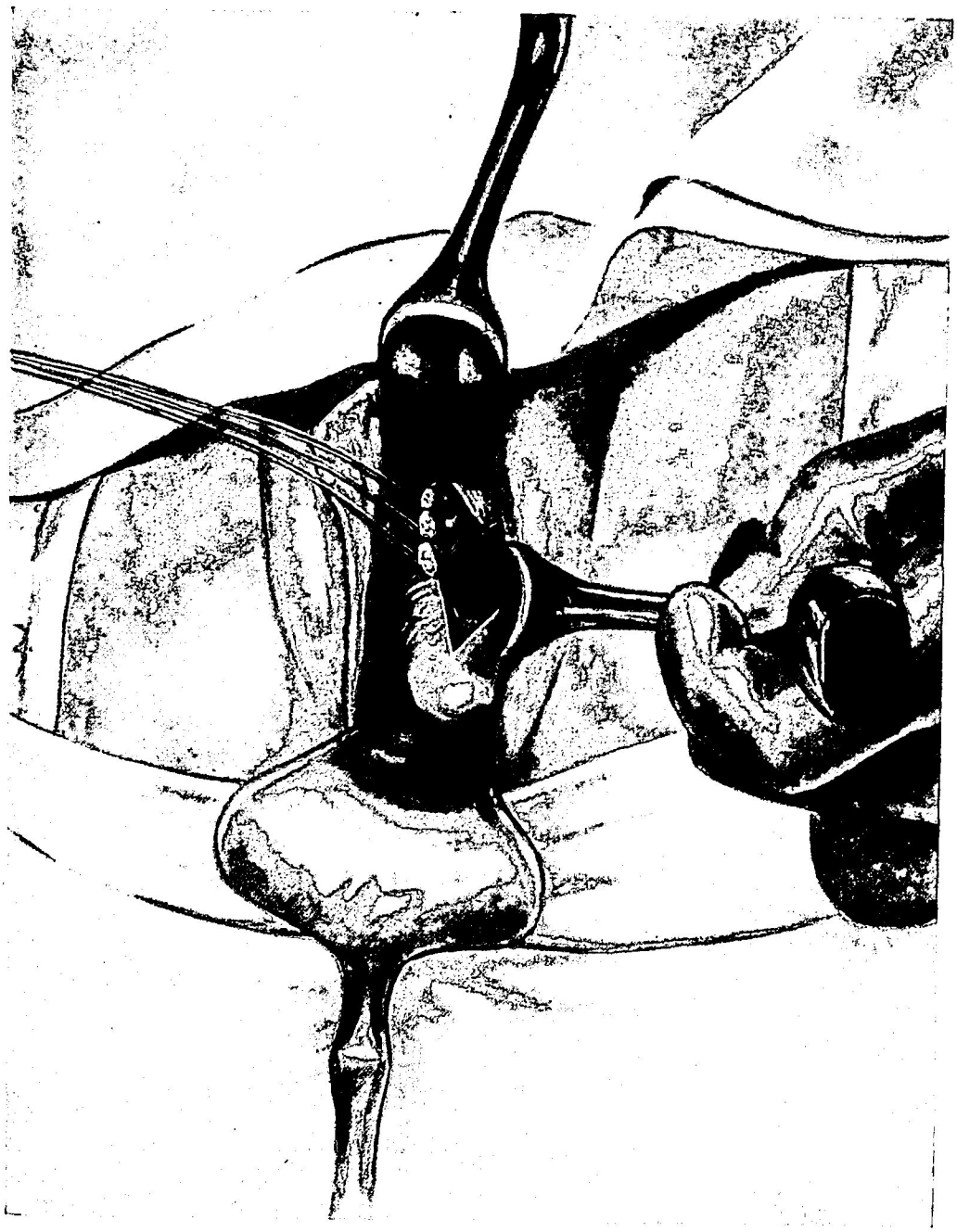

FIG. 87. The peritoneum of the bladder is sutured to the anterior wall of the uterus and the 3 stumps of the pedicle to the right margin of the vaginal incision.

abdomen safeguards an anteversion of the uterus and prevents the formation of a stump exudate.

Wertheim* performs the operation for an ovarian cyst in certain especially favorable cases through the posterior celiotomy. We reject this procedure since we consider the antefixation of the uterus at the completion of the operation as an integral part of the operation.

A patient who was operated on in our clinic in 1949 illustrates the fact that an operation can be carried out as gently and carefully by the vaginal route as by a laparotomy. The patient concerned was in the 3rd month of her pregnancy and complained of dyspnea and a rapid enlargement of her abdomen. The examination revealed a uterus of a size larger than a man's fist which entirely filled out the sacral excavation; on top of it there was a palpable round cystic tumor that extended the width of a hand over the umbilicus. The diagnosis was a pregnancy of 3 months and an ovarian cyst. The cyst was removed in the usual way through the vagina. The pregnancy remained undisturbed and was terminated in a full-term baby 6 months later.

* Wertheim and Micholitsch: Die Technik der vaginalen Bauchhoehlenoperationen, Leipzig, Hirzel, 1906.

FIG. 88. The colpotomy incision is closed except for a small opening for drainage purposes. The left margin of the vagina is drawn aside, which brings the opening into better view.

9

Operation by the Vaginal Route for Ectopic Pregnancy

There are no precise instructions to be found in the entire literature of the world as to how to operate for ectopic pregnancy by the vaginal route. However, one can find occasional remarks about the removal of a pregnant fallopian tube, but nothing decisive as to an exact procedure for such an operation or as to how the wound has to be attended to.

Obviously, not every case is suitable for a vaginal operation, in particular, cases of ruptured ectopic pregnancies. These patients are much too exsanguinated, and an exact hemostasis can best be carried out through a laparotomy in which the adnexa can be clamped off in the quickest and safest way. However, even the operation for a ruptured pregnant tube is technically possible by the vaginal route. Many years ago we had to treat a completely exsanguinated patient. A blood transfusion was not possible, and we were afraid to subject this patient to a laparotomy because of the grave situation that she was in. The decision to operate by the vagina was made immediately, and in a few minutes the pregnant tube was removed under superficial anesthesia. In spite of such occasionally hopeful incidences, we would not suggest the vaginal route as the operation of choice for such cases. The amount of blood that accumulates in the abdominal cavity is difficult to remove from below and obviously could give cause to a prolonged and febrile convalescence. Therefore, the laparotomy would be preferable to the vaginal approach. In the case reported above, the blood could not be removed entirely, and the postoperative course was a rather stormy one. Antibiotics were not at our disposal at that time. Nevertheless, the patient was finally discharged completely cured.

Women with too far advanced pregnancies and large tumors and women who have a record of a previous laparotomy performed on them are not suitable for the vaginal operation. Adhesions resulting from such previously performed operations would interfere with the topical anatomic conditions and disturb a proper visualization. The most favorable cases for vaginal operations are (1) women whose exact histories point to the existence of a pregnancy and in whom a bimanual examination reveals a tumor about the size of an egg on one side of the uterus and (2) women on whom an explorative celiotomy is done for a suspected ectopic pregnancy.

We consider the posterior explorative celiotomy to be superior to the almost generally used puncture of the Douglas pouch, since the opening up alone would show whether or not an ectopic pregnancy exists. There are two possibilities of error in doing a puncture. First of all, we might aspirate blood in the syringe and still there might be no tubal pregnancy. The bleeding in such cases might have originated from a ruptured follicle or from a corpus luteum cyst. On the

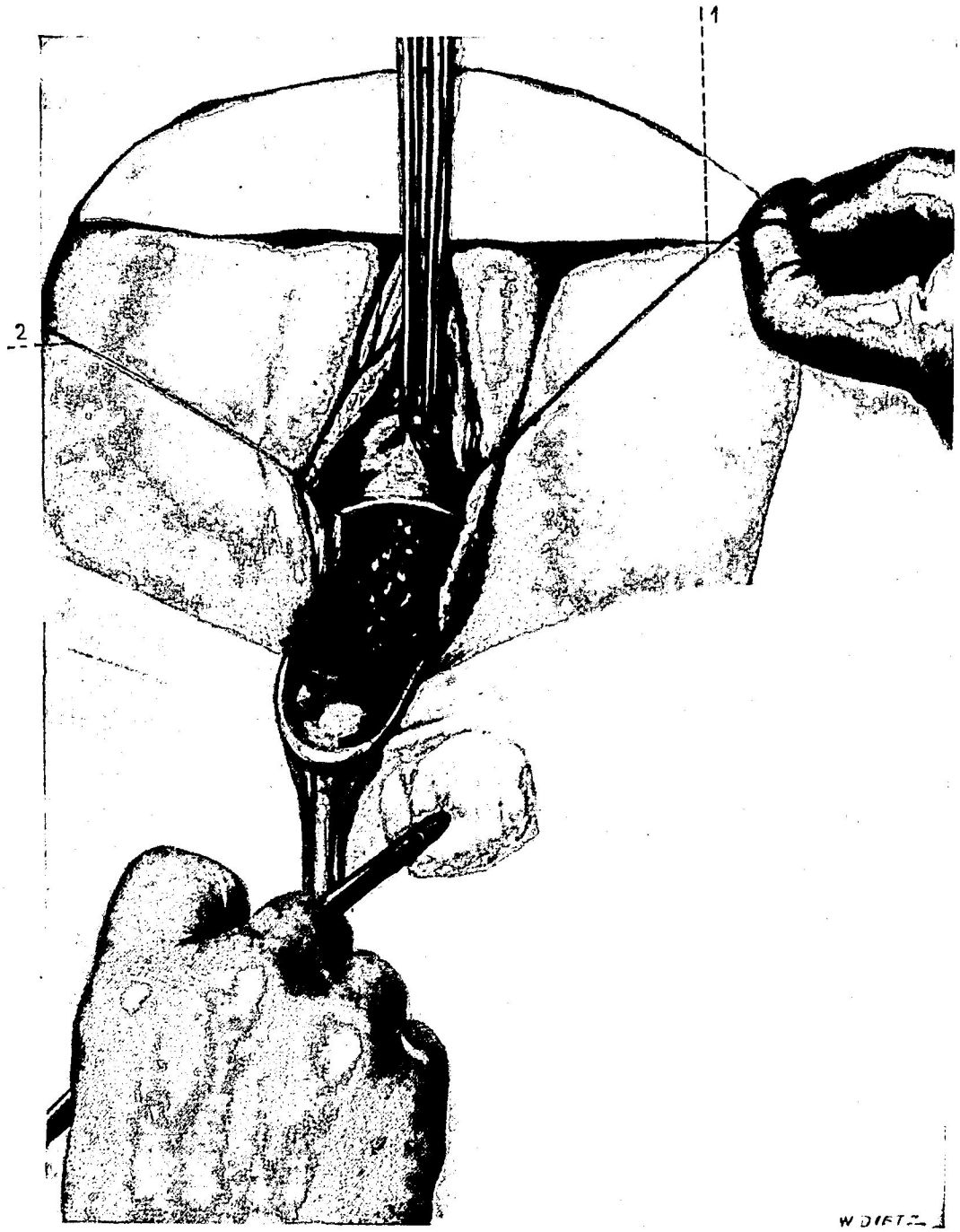

FIG. 89. The content of the hematocele is protruding through the posterior colpotomy. (1 and 2) The peritoneum of the Douglas pouch and the margin of the vaginal incision are sutured together for a reliable fixation.

other hand, the puncture might fail to produce blood if the Douglas pouch is closed toward the abdominal cavity by adhesions, but still there might be a pregnancy of only a few weeks. With regard to this, we report the following most interesting case.

A young woman with a typical history of an ectopic pregnancy was examined, and a tender tumor in the Douglas pouch was palpated. The tumor was punctured, and clear fluid was aspirated into the syringe, which made us believe that the diagnosis of an ectopic pregnancy was not correct. The complaints of this patient became worse, and a few days later we decided on an explorative laparotomy. It showed that there was an ovarian cyst present that had filled the Douglas pouch completely, and on top of this cyst the pregnant tube was adherent.

The presence of a hematocele is no contraindication to a vaginal operation. The drainage through the Douglas pouch will always permit the outflow of the discharge.

The course of the operation is as follows. We start with a posterior celiotomy. If there is a flow of blood through the incision (Fig. 89), the incision is hemstitched, and the index finger of the right hand is introduced into the same for exploration of the adnexa. The specula, of course, have to be removed temporarily. Only by so doing will the finger retain its freedom of movement. This will enable one to gain an impression as to the location and the size of the tumor and, at the same time, to free loosely existing adhesions. Next, the posterior celiotomy is temporarily abandoned, and an anterior celiotomy is added. This is done because the anterior incision will safeguard a proper attendance of the stumps and will prevent a retroversion of the uterus. The anterior celiotomy is made, as usual, in the longitudinal mid-line. The plica is opened, the tenaculum is removed, the cervix is pushed back into the posterior fornix, and the desired horn is exposed after we have reached the fundus by proceeding up the anterior wall of the uterus with a fine one-toothed hooked instrument (Fig. 90). Most surgeons continue the operation in a way that involves the greatest technical error. Next, they pull the uterus down into the vagina, with the intention of bringing the diseased tube into view. This is bound to render any further performance of the operation only more difficult; it deprives the surgeon of a great part of the already limited space. The body of the uterus, on the contrary, must not be dislocated into the vagina but should be pushed away to the healthy side, always within the abdominal cavity, never out of it. Next, a catgut rein is sutured into the exposed uterus horn (Fig. 91), and the diseased tube is grasped in a Pean clamp and slowly brought out into the vagina (Figs. 92 and 93). Occasionally, this maneuver requires the separation of some adhesions, which is done under visualization. If the tube is too big and if it is difficult to luxate it into the vagina, it is divided and its content expressed; the empty sac is easily dislocated into the vagina. The mesosalpinx is clamped off with 2 curved clamps (Fig. 94) and cut through. The ovary always can be saved. Next, the tube itself is detached over a curved clamp, not too close to the uterus horn but some distance from it in order to save some part of the tube (Fig. 95). If this stump finally is fixed to the vaginal marginal incision, the uterus will still retain sufficient mobility for a future pregnancy. Next, the bladder peritoneum is sutured to the uterus behind the stumps with 2 or 3 sutures.

Using the threads that were left long, the two stumps are now fixed to the respective vaginal flaps; the threads are rearmed with a new needle and are used

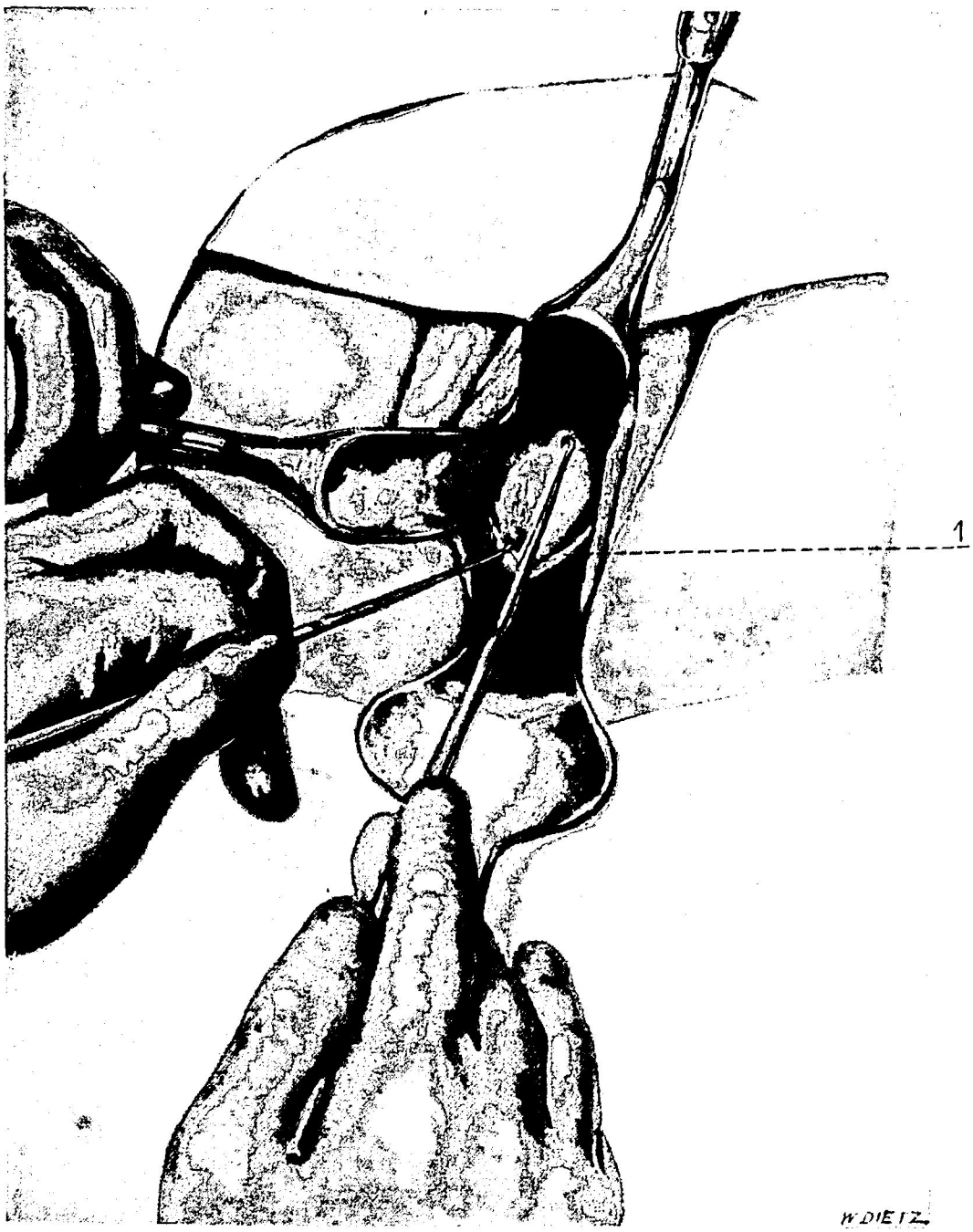

FIG. 90. After completion of the anterior mid-line colpotomy, one proceeds upward with the small hook to the detachment of the fallopian tube. (1) Lower margin of the plica.

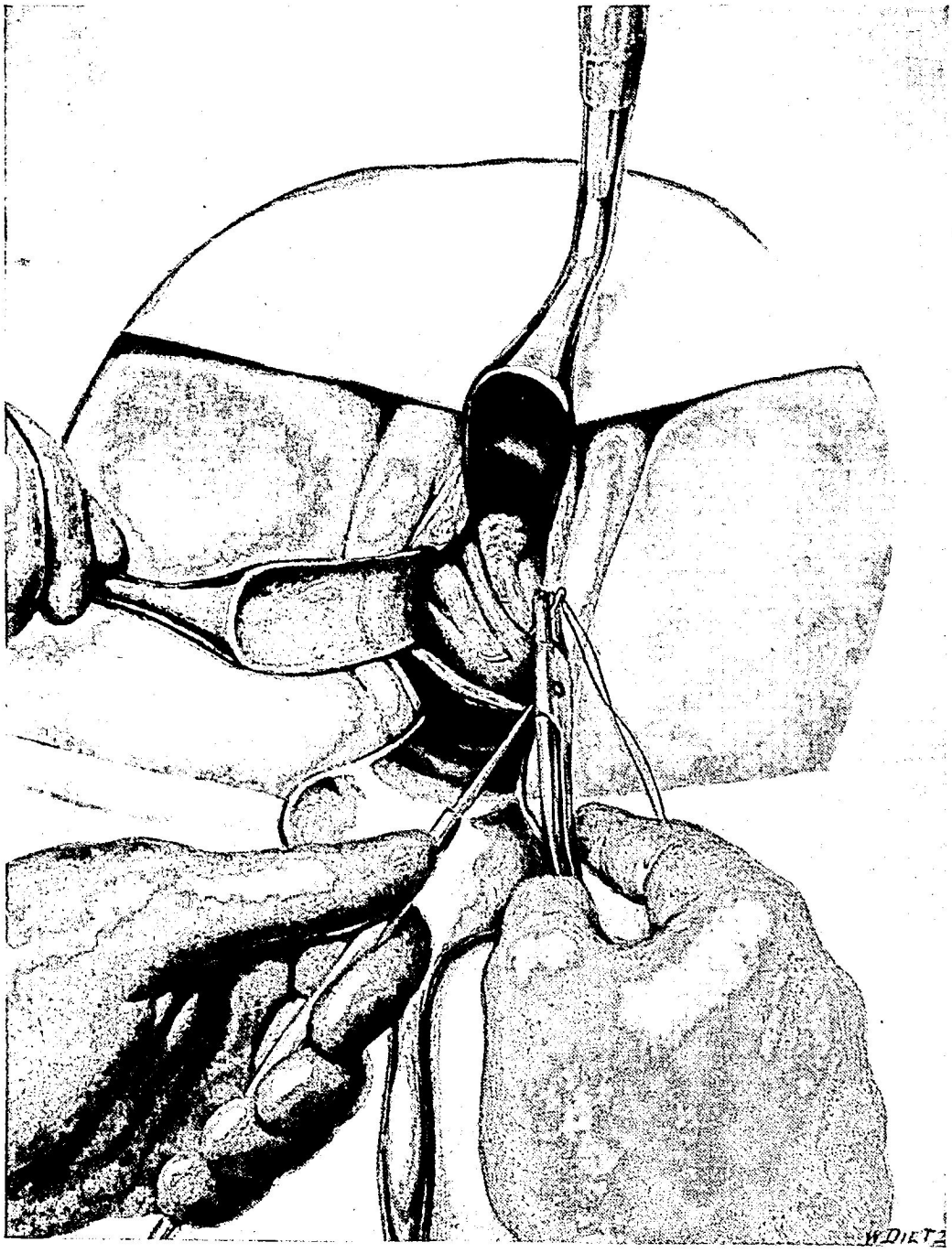

FIG. 91. The pedicle of the adnexa of the diseased side is held in a suture. Note the position of the uterus as it is not drawn into the vagina but moved in the direction of the healthy side—always within the peritoneal cavity.

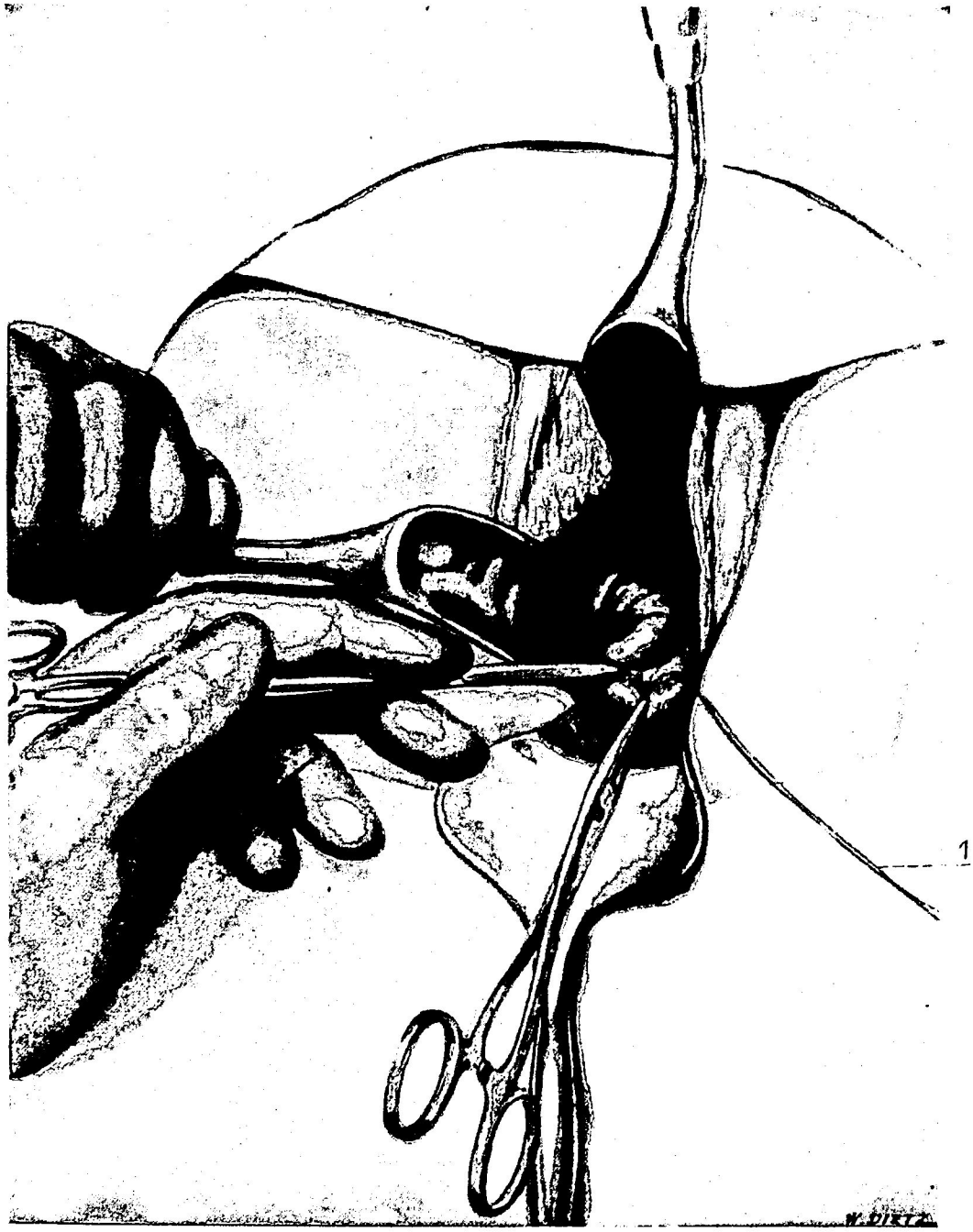

FIG. 92. The fallopian tube is developed by grasping it in clamps. (1) Rein at the junction of the right adnexa.

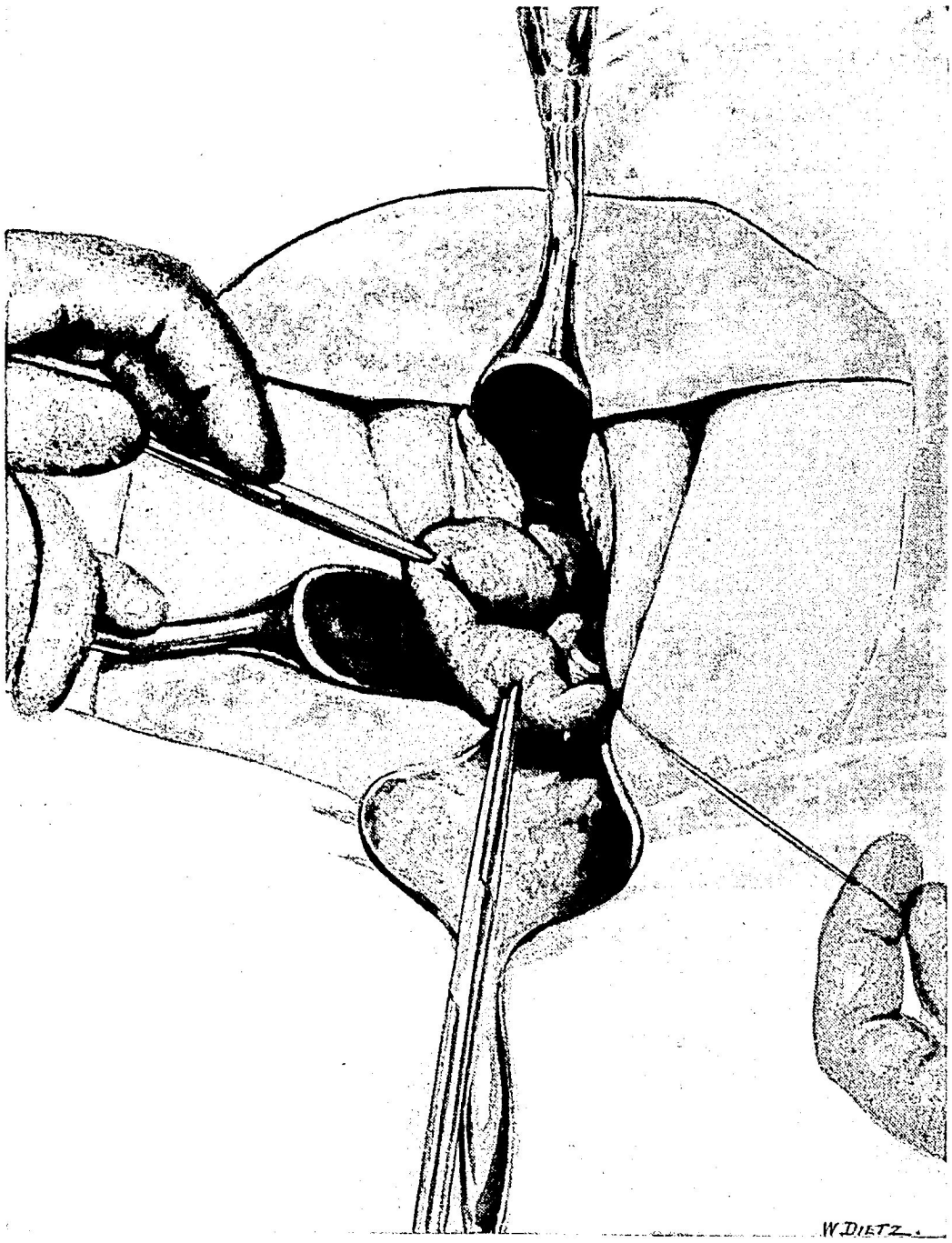

FIG. 93. Further progress. Note the enlarged pregnant tube.

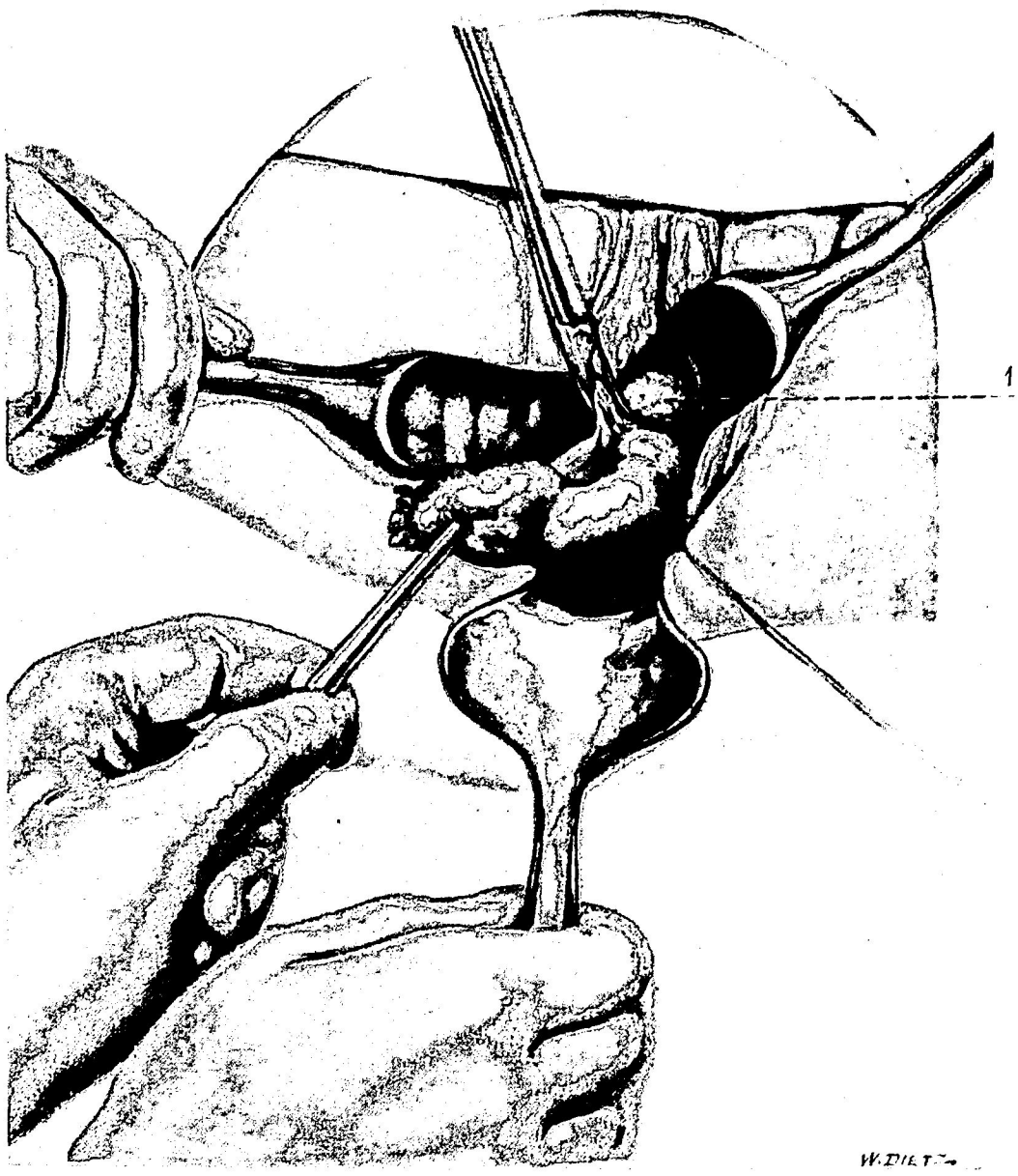

FIG. 94. The tube is completely developed into the vagina, and the mesosalpinx is held in a clamp. (1) Right ovary.

as transfixion sutures (Fig. 96). Thus, the stumps protrude into the vagina. Postoperative bleeding, if any, or a discharge will find its way out into the subvesical space and not into the free abdomen. This will prevent the formation of a stump exudate. The celiotomy is reduced with a number of sutures, and a gauze is introduced into a small opening. After this is done, the surgeon returns to the posterior celiotomy and separates it with 2 long specula that are introduced into the open peritoneum. Using a sponge forceps, blood is now carefully removed from the cavity, and a rubber T-drain is inserted. The gauze is wound around this drain (Fig. 97). The head of the table is raised in order to let some blood that might have accumulated escape. The secretion usually ceases after 2 to 3 days, and the drain is removed. The drain is used not only as a means of drainage but it is also of great importance for a smooth healing process in cases where parts of a hematocele have been left behind. The drainage through the posterior celiotomy is an integral part of the operation; only such a drainage will guarantee a postoperative course with no complications. We ourselves have never noted any undesirable results in our numerous operations from using this drain.

By suturing the stumps to the marginal incision of the vagina a fixed retroversion of the uterus can be prevented; such a situation could easily develop if parts of a hematocele are left behind.

Women operated on in the above described way can become pregnant repeatedly and always can be delivered of a healthy baby at full term.

Sometimes, years later, these same patients had to be operated on for different causes, and laparotomies were employed. The charts of these patients never revealed evidence of adhesions. The abdominal cavities were found to be completely clean.

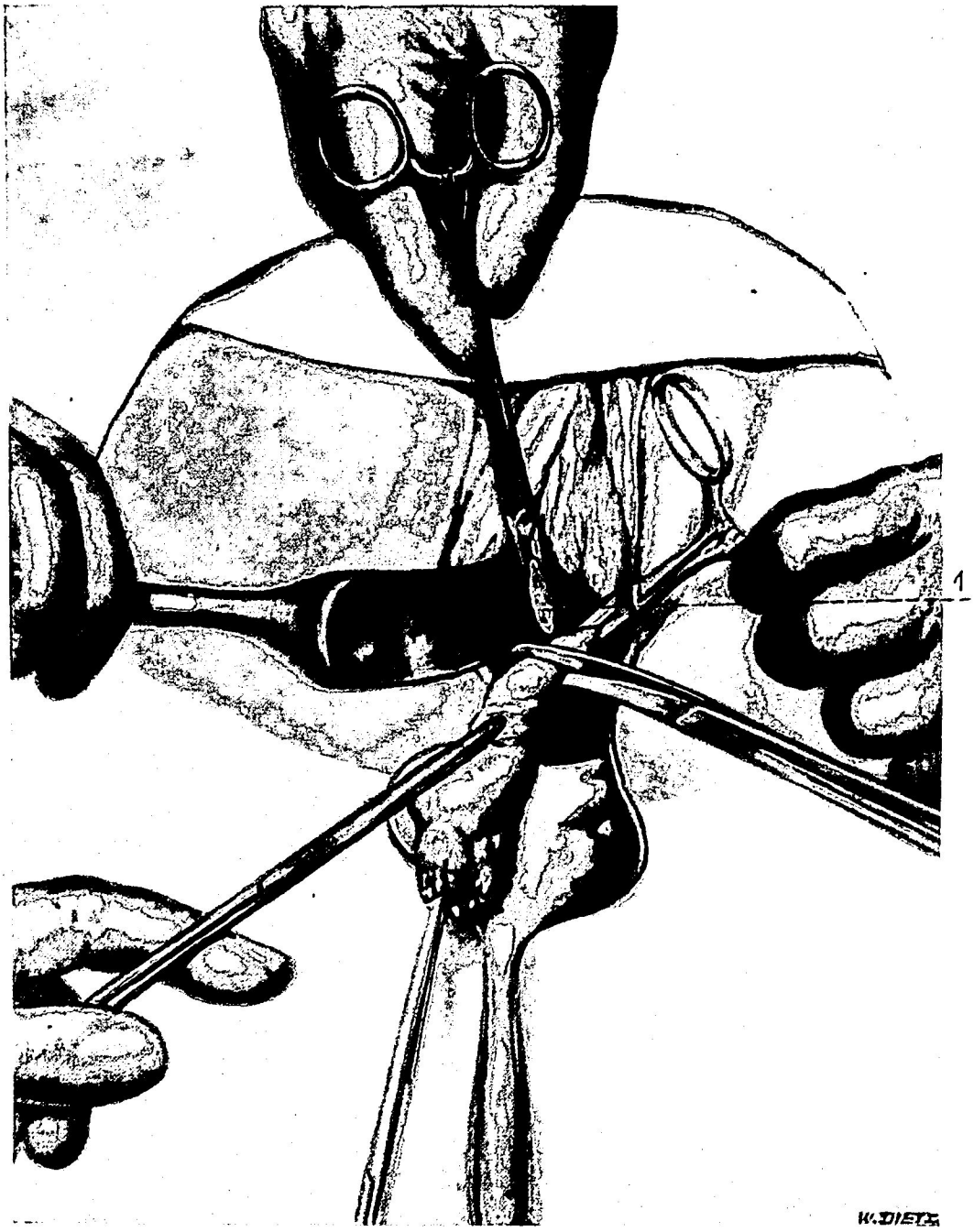

FIG. 95. The mesosalpinx is severed. The tube is dissected over a clamp. (1) The mesosalpinx, cut through.

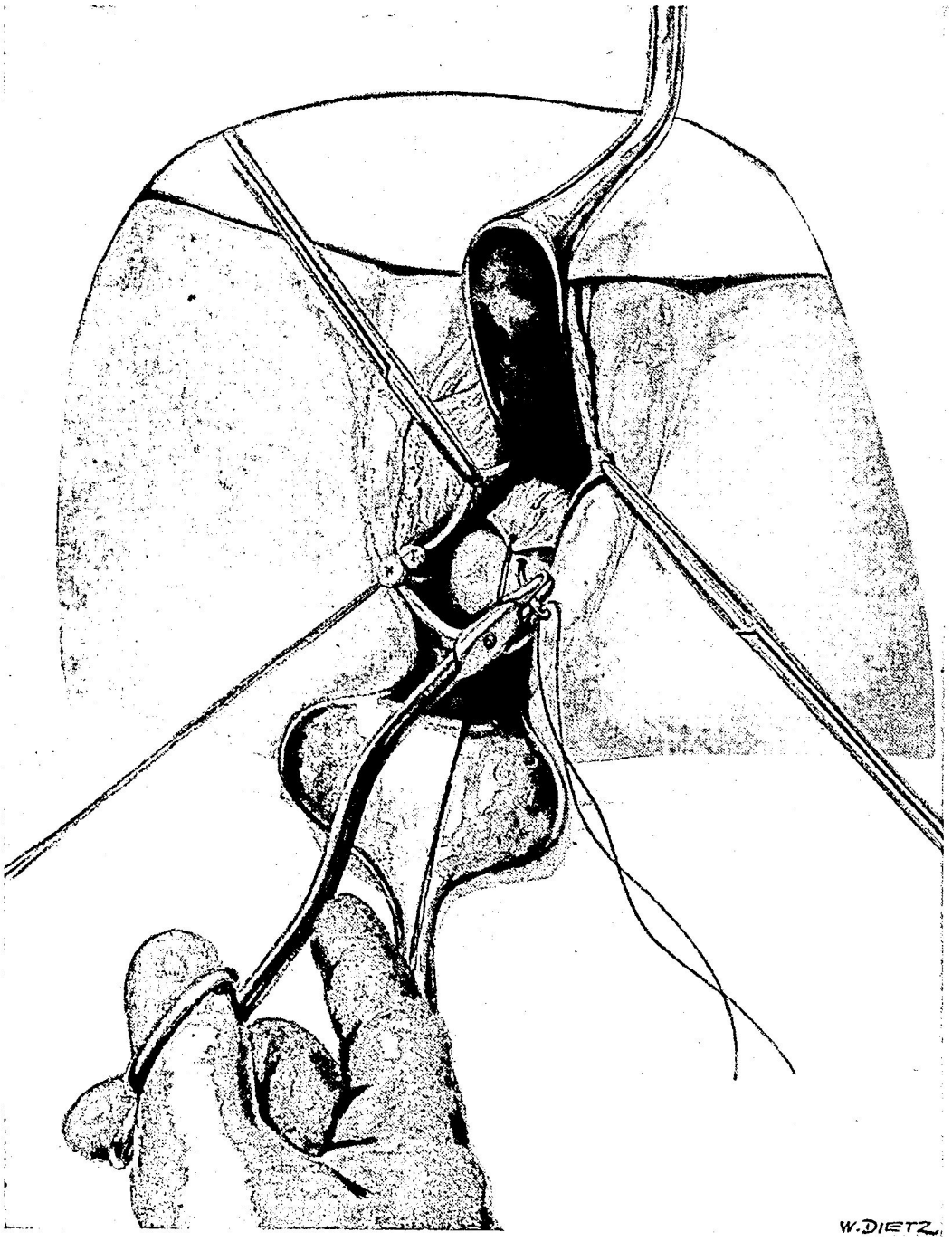

FIG. 96. The stumps are being sutured to the margin of the vagina at the same side. The peritoneum of the bladder is sutured to the fundus of the uterus. The lumen of the tube is clearly visible.

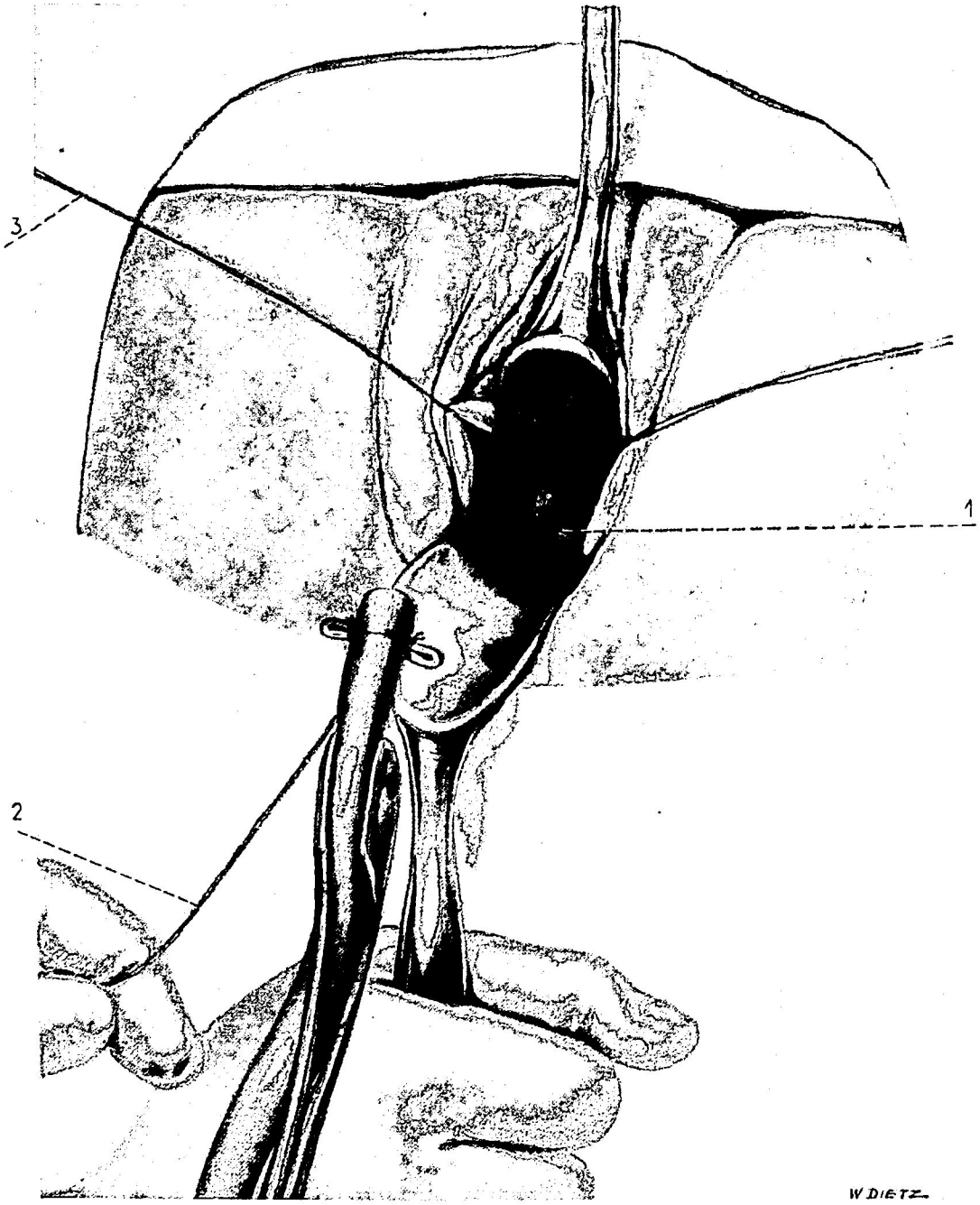

FIG. 97. The peritoneal cavity has been cleaned repeatedly. A "T" drain is introduced through the posterior colpotomy and surrounded by some gauze. (1) Intestinal coils in the posterior colpotomy. (2 and 3) The peritoneum of the Douglas pouch is sutured to the margin of the vagina.

10

Tubal Sterilization by the Vaginal Route

The operation for sterilization of the fallopian tube is carried out principally by the vaginal route. Only if there are definite reasons for a laparotomy, such as a simultaneous appendicitis, is the laparotomy the operation of choice. The same applies to a pregnancy of more than 4 months, since the uterus still remains too big for the visualization of the adnexa from below, even after it is emptied of its content.

There are many ways to obliterate a tube. The original and frequently used method, which consists of the ligature of the tube, with the resection of a part of it between 2 ligatures, has been abandoned, for it proved to be unreliable; it can happen that the ligatures cut through and the tubes become patent again.

The total extirpation of the tube is done only if the ovary has to be removed as well. The removal of an ovary by the vaginal route is technically more difficult than the extirpation of both organs together. We object to the idea of a complete removal of a tube for the purpose of sterilization only, as this will deprive us of the possibility to reimplant the tube in the future if so desired.

A fairly safe method is the cuneiform excision of the interstitial part of the tube. The uterus wound has to be sutured carefully, and the bladder peritoneum must be fixed at the back of the dissected tubes, which transfers them into an extraperitoneal position. Occasionally, the hemostasis after such a cuneiform excision causes some difficulties and is also time-consuming. Very often the development of a hematoma cannot be avoided. We ourselves do not use this procedure, because Madlener's crushing method has given us excellent results.

To perform the Madlener sterilization we first make an anterior mid-line colpoceliotomy. After the plica is opened we proceed up the anterior wall of the uterus, using the one-toothed hooked instrument, simultaneously pushing the cervix back into the posterior fornix. Thus, we bring the horn on one side into good view and push the fundus to the side, being careful to avoid dislocating the uterus into the vagina (Fig. 98). Next, the tube, which must not be mistaken for the round ligament, is grasped in a small clamp (Fig. 99). The tube usually is more movable. In a case where the differentiation is doubtful, it is advisable to grasp the tube between 2 small forceps and visualize it in its entire length. The forceps must grasp the tube proper and not the mesosalpinx, since this might injure the tissue and create a hematoma.

With the aid of the above-mentioned clamp on the tube, we pull a sling of the tube into the colpoceliotomy and crush it with the Madlener clamp. By compression, the muscularis of the tube and the mucus membrane are destroyed, and the lumen is obliterated by the ensuing scar. The vertex of the tubal sling is dissected with a scissors (Fig. 100), and the Madlener instrument is replaced by a catgut ligature which comes to lie in the crushing furrow, which actually consists only

FIG. 98. The left uterus horn is exposed from the anterior mid-line colpotomy. The uterus is in the peritoneal cavity and moved to the right side. The detachment of the left round ligament and the left tube appear in the visual field. (1) Left fallopian tube. (2) Left round ligament.

FIG. 99. The cervix has been pushed into the posterior fornix; the tube is held in a Pean clamp. (1) Left fallopian tube.

of peritoneum. This is duplicated at the opposite side. For the crushing site we prefer the place close to the uterus, since this will render a future reimplantation easier. The resection of the tubal vertex prevents the stump from becoming necrotic. The stump itself is very small (Fig. 101), and we can easily permit it to disappear into the free abdomen. Next, the plica vesicouterina is closed again.

However, if we intend the tubal stump to be extraperitoneal, we have to perform the crushing at some distance from the uterus; this will allow the stump to be more movable and to be fixed in the subvesical space through a small opening after the plica has been closed. The colpotomy is reduced with catgut sutures, and a gauze is introduced into the space between the bladder and the cervix. The gauze is removed the following day.

Difficulties in the vaginal operation for sterilization can be encountered if it is performed immediately following an interrupted pregnancy. If the pregnancy is only of a few weeks duration we empty the uterus by dilatation and curettage, and perform the operation as described above. If the pregnancy has existed 4 months or longer, we divide the cervix after a mid-line colpotomy has been made, and empty the uterus either by instruments or by the finger (Fig. 102). At this stage it is advisable to open the plica and leave the hysterotomy incision unattended for the time being (Fig. 103). We can approach the uterus horn better this way. The uterus can be tilted better without a sutured hysterotomy than with it; the suture would make the cervix wall too stiff. This is a very important technical detail which, unfortunately, is too often neglected. Next, we proceed with the hook above and laterally and give an intravenous injection of Pituitrin which will make the uterus harder, smaller and more movable. Also, placing the patient in a slight Trendelenburg position will help. Once the round ligament is reached, we hold onto it with a clamp and use this clamp as a rein; pulling on it brings the uterine detachment of the tube into view (Fig. 104).

If the uterus remains big and soft in spite of the administration of Pituitrin, the exposure of the horn becomes difficult. Every stitch canal is a source of bleeding due to the existing hyperemia and the friability of the uterine tissue. If this prevails, we leave the hook aside and insert a small sponge forceps alongside the margin of the uterus up to the height of the tube and pull it back again, pressing its point slightly toward the sacral-bones. The cervix is pushed back into the posterior fornix at the same time. Very often the tube follows this wiping maneuver, and it can be grasped in a fine clamp. After the tubes have been taken care of, the operation is finished by suturing first the plica and then the cervix with catgut (Fig. 105).

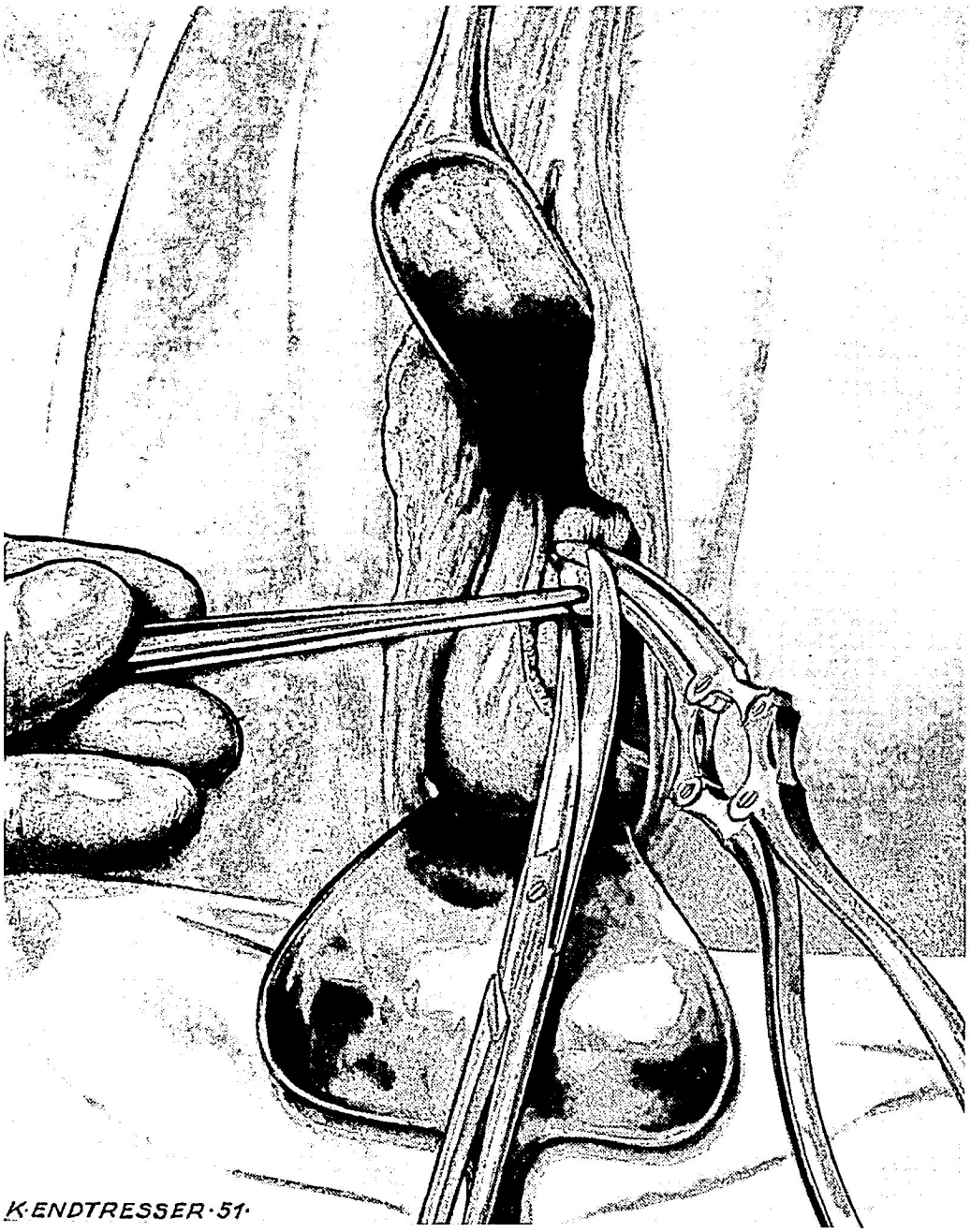

FIG. 100. The loop of the tube is crushed in a Madlener clamp; its vertex is being resected with a scissors.

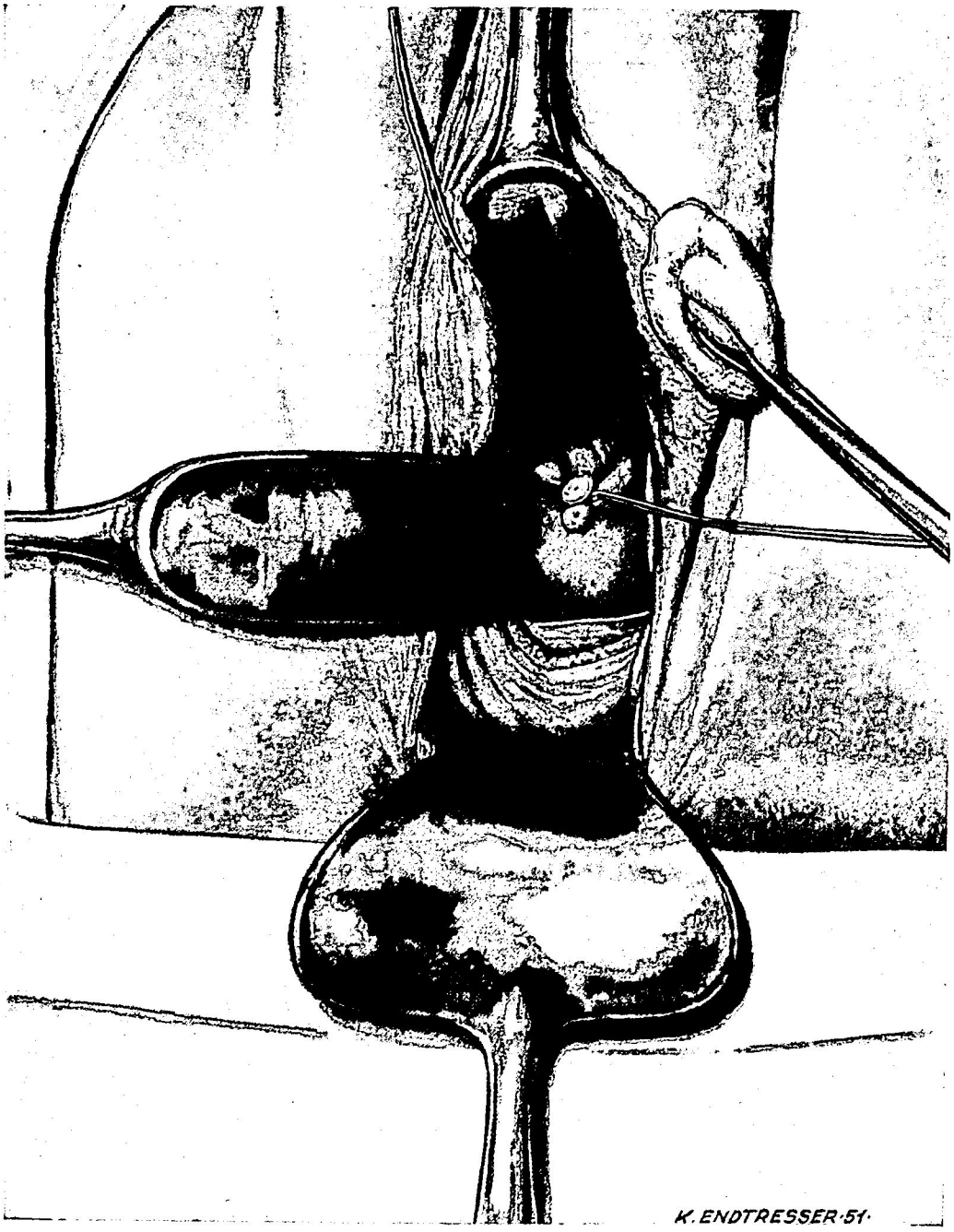

FIG. 101. The small stump of the tube is protruding, and the lumina of the tubes are visible.

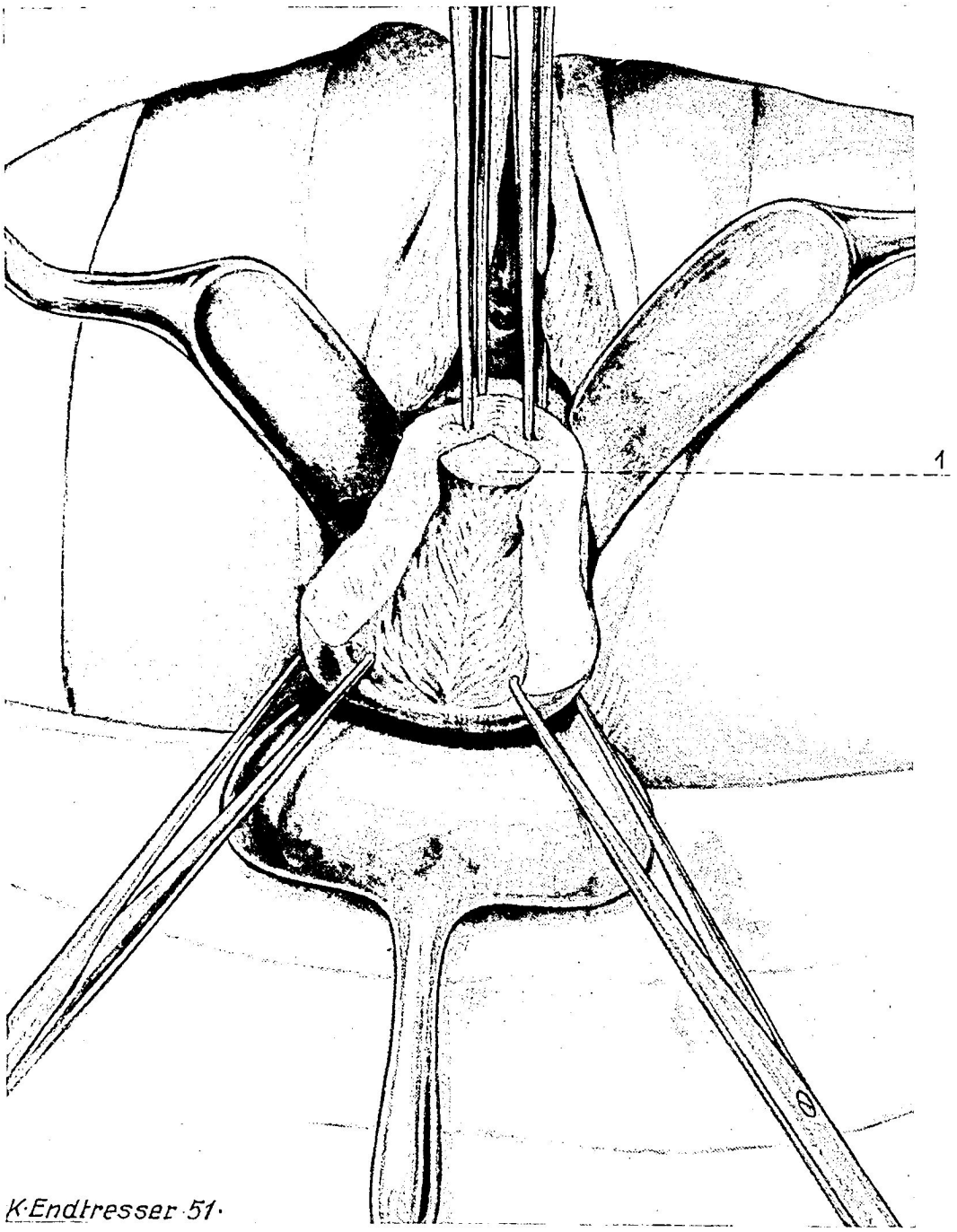

FIG. 102. The anterior wall of the cervix is divided up to the internal os. The lower pole of the amniotic sac is visualized in the internal os. (1) Lower pole of the amniotic sac.

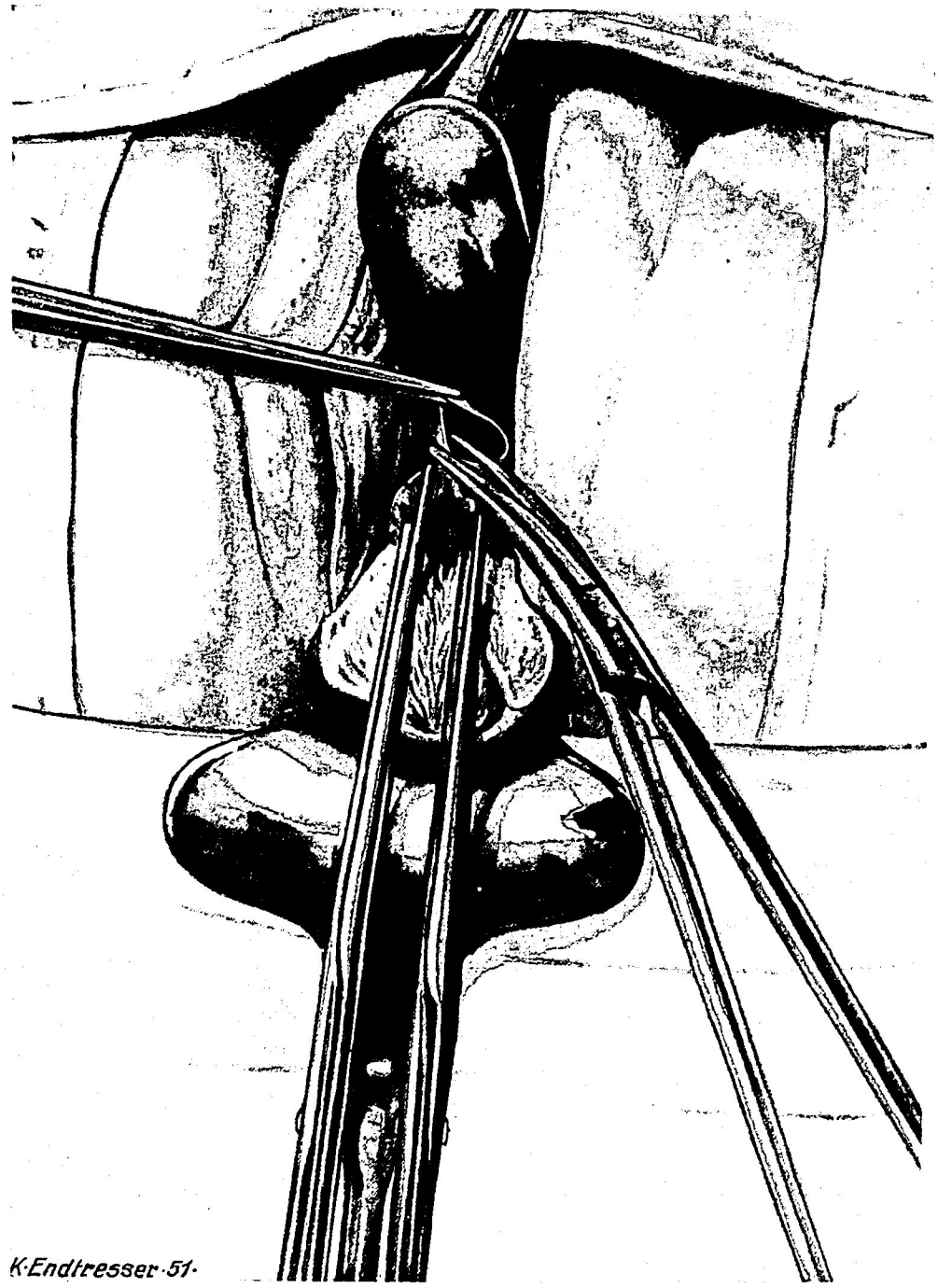

FIG. 103. The plica is opened. The divided anterior wall of the cervix lies in the introitus of the vagina.

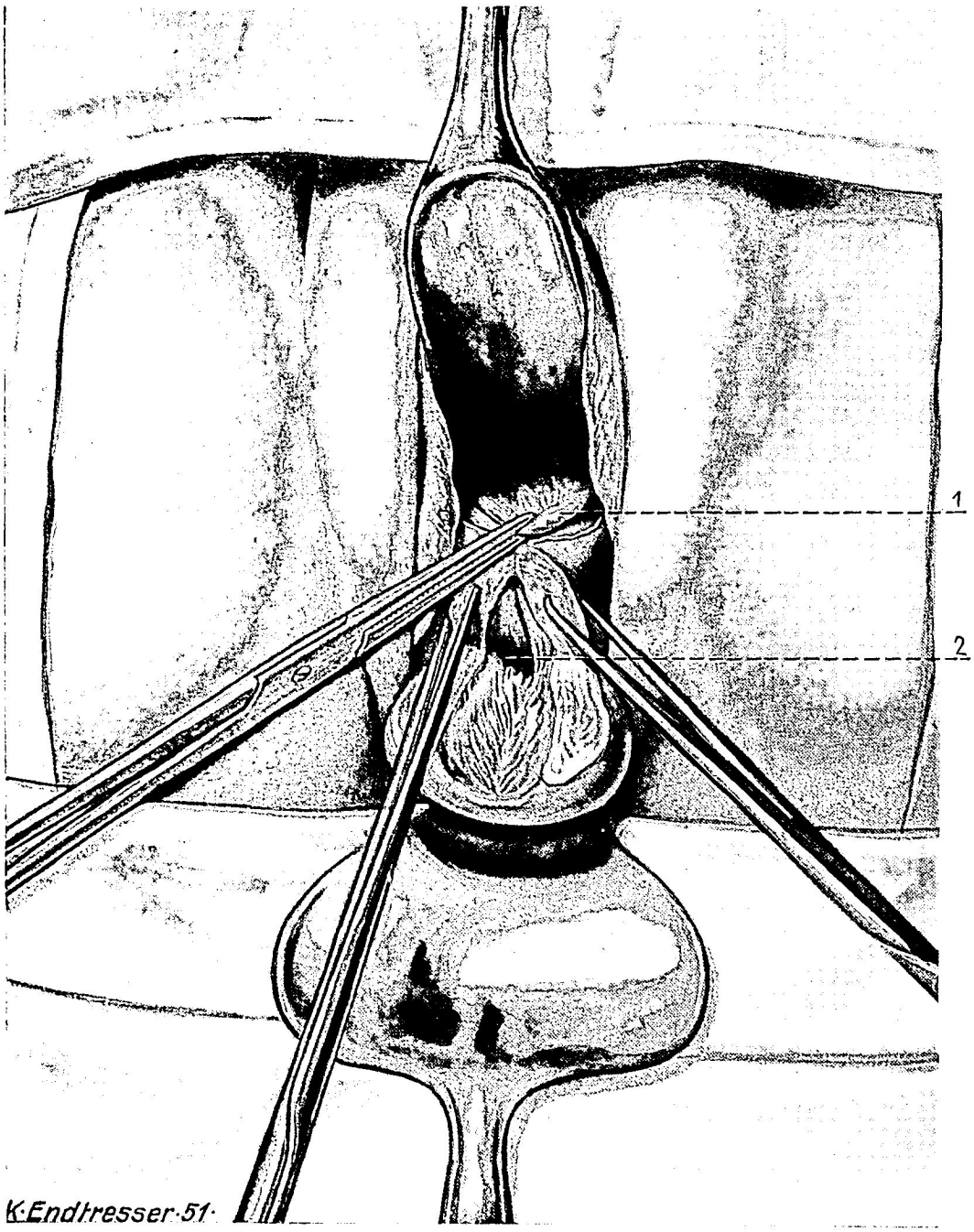

FIG. 104. The tube is grasped and drawn downward. The broken axis line of the uterus is clearly seen in front; this has been made possible by the surface of the wound being not yet united. (1) Left tube. (2) The break in front.

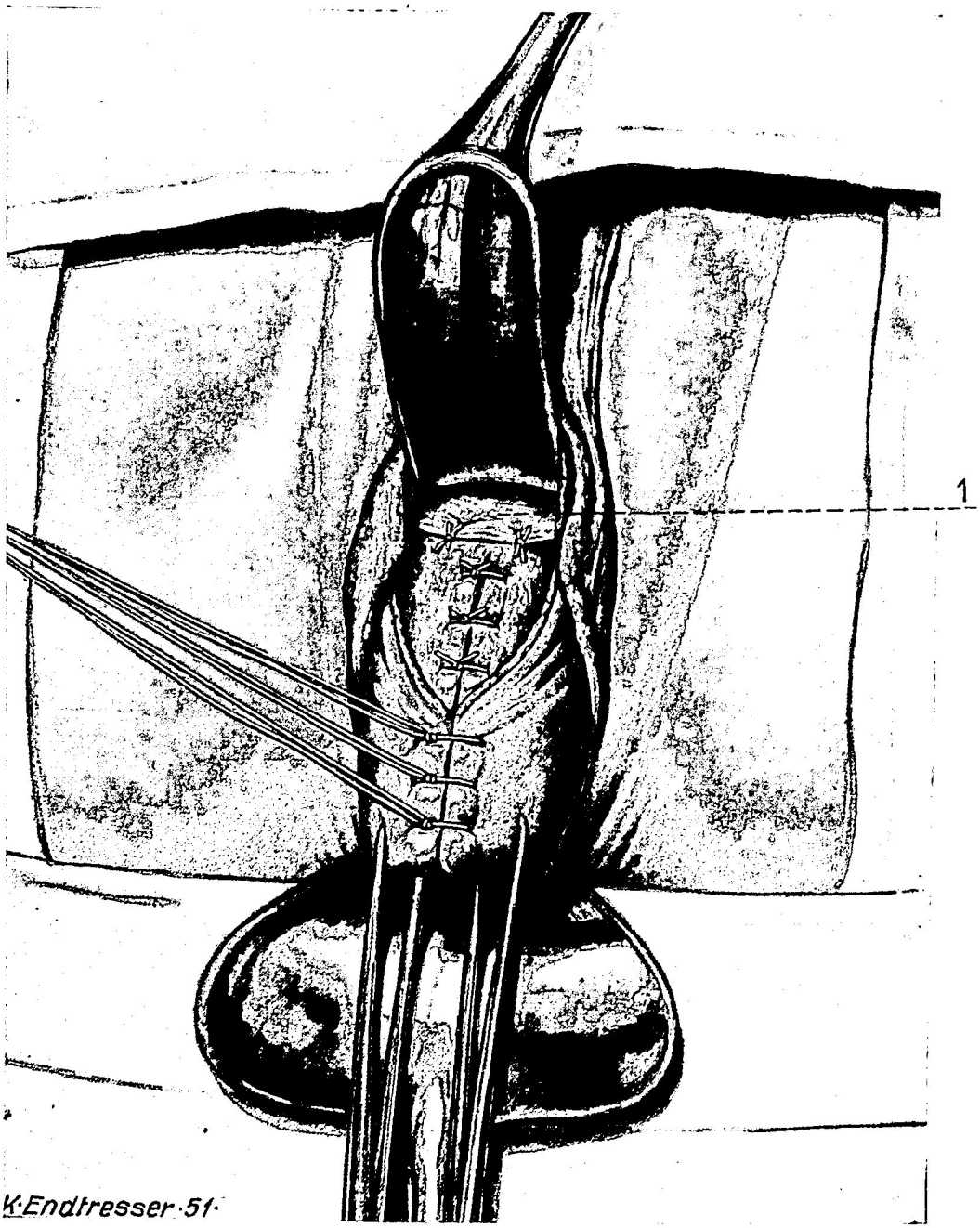

FIG. 105. The operation is completed. The cervix is sutured, and the colpotomy incision is closed but for a small opening for the gauze drain. (1) Peritoneum of the bladder.

11

Vaginal Antefixation of the Uterus by Abbreviation and Fixation of the Round Ligaments

In former times too much attention was paid to the mobile retroversioflexion of the uterus. Today we are not disturbed too much by this condition. Pain in the back associated with a retroversion of the uterus was treated either by a pessary or very often also by an operation. We know now that such a displacement of the uterus only rarely causes clinical symptoms and also that in the majority of cases concurrent pains in the back find their explanation in quite different causes, with the result that surgical treatment of a retroversion rarely becomes necessary and is resorted to only when a young woman simultaneously develops a prolapsed vagina or very rarely in a case of sterility.

Wertheim's technic begins with a horizontal colpotomy. Next, the uterus is grasped in a tenaculum, and the junction of the adnexa is visualized. The round ligament on one side is held in a clamp about 1½ cm. away from its connection with the uterus and is pulled down. The two parts of the thus-formed slings are united by 2 or 3 silk sutures and are permitted to fall back into the abdomen. The same procedure is duplicated on the opposite side.

If the uterus is heavy and has a tendency to return to its retroverted position, the ends of the sling are sutured on both sides to the corners of the colpotomy. The peritoneum is closed, and the vagina is sutured.

Later this technic was slightly changed. In its altered form it has remained the technic of our choice up to the present time. From a mid-line anterior colpocelio-tomy the round ligaments are grasped in a clamp at a distance of about 1½ cm. from the uterus (Figs. 106 and 107) and, abandoning the previously described combination sutures of the two parts of the ligament, are pulled through a buttonhole which is made on either side of the vaginal flap rather closer to the urethra than to the neck of the uterus (Fig. 108). The ligaments are fixed at this point with some silk sutures (Fig. 109). Two sutures go from the outside through the vagina and the tips of the ligament sling and one suture from the inside of the vagina; in combination, these sutures will safeguard the fixation of the ligaments to the inner wall of the vagina (Fig. 110). The peritoneum is closed, and the colpotomy sutured up to a small opening, which is used for a gauze drain (Fig. 111). The external silk sutures are removed after 6 weeks if they have not disappeared spontaneously.

This is an easy operation. It renders excellent anatomic results and never will interfere with a pregnancy or a delivery.

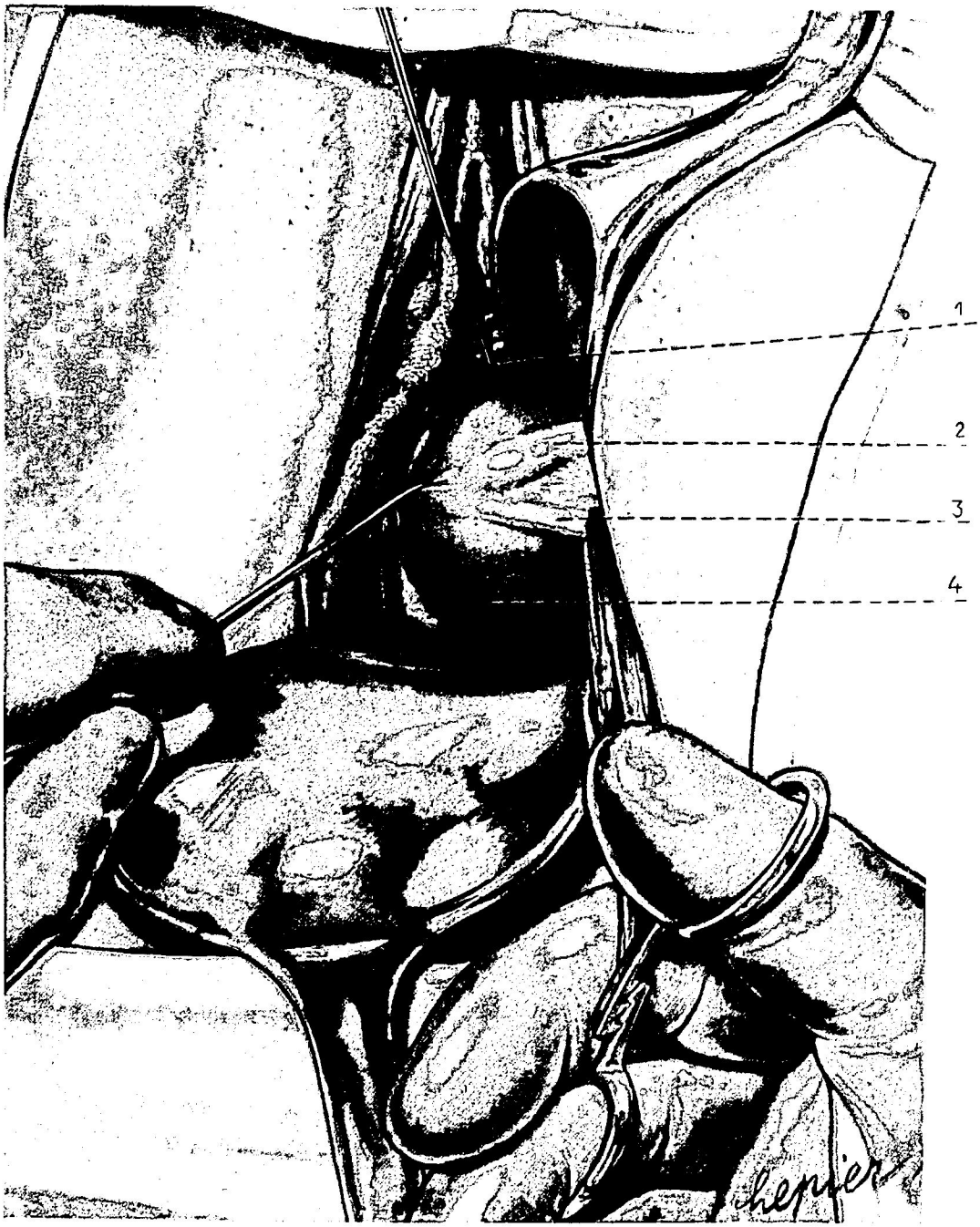

FIG. 106. After the anterior mid-line colpotomy, the left round ligament is reached by proceeding with the small hook upward on the anterior wall of the uterus and is held in a Pean clamp. The tenaculum on the cervix has been removed. (1) Margin of the plica. (2) Left fallopian tube. (3) Left round ligament. (4) Body of the uterus.

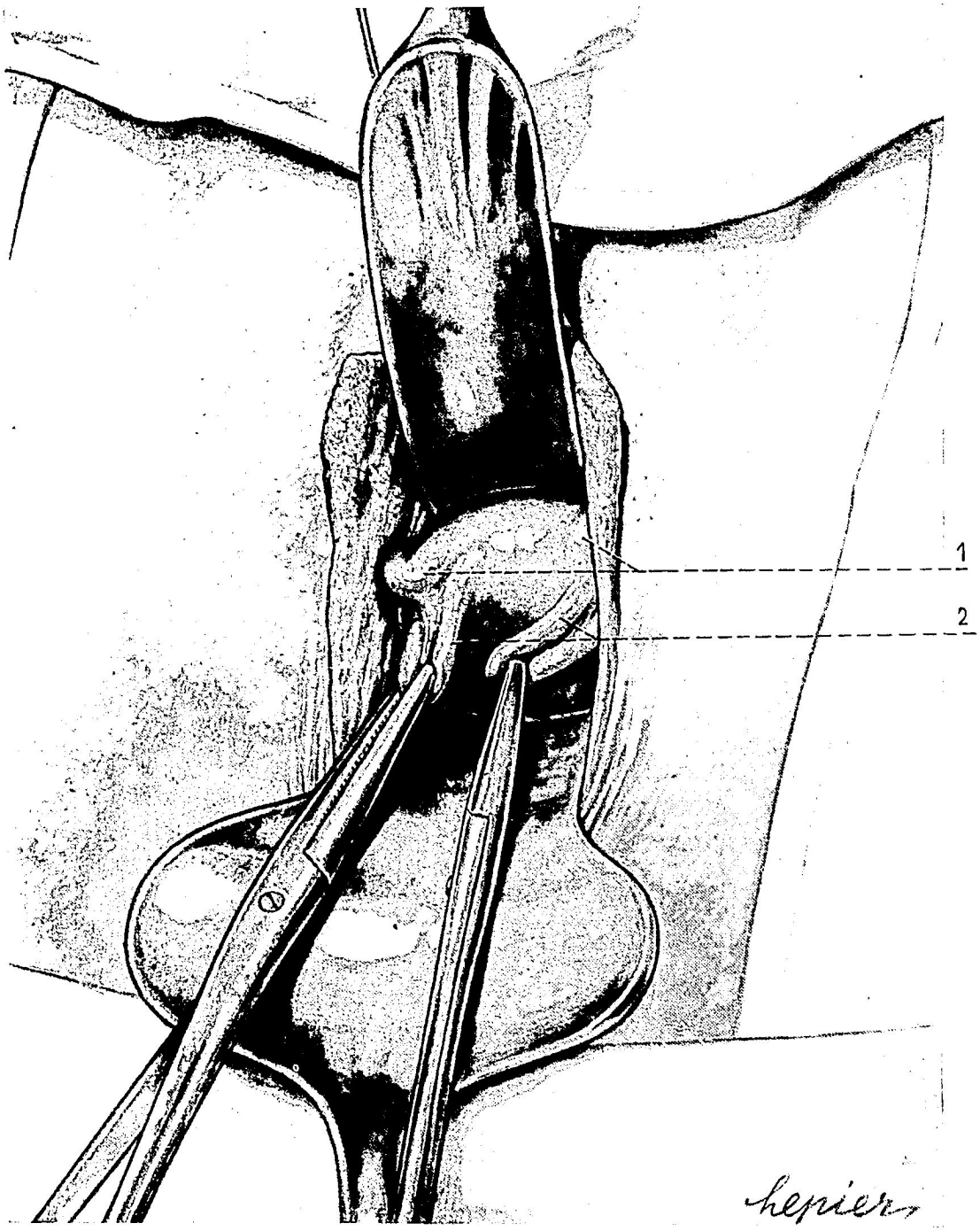

FIG. 107. Both round ligaments are grasped and drawn in front. (1) The fallopian tubes. (2) The round ligament.

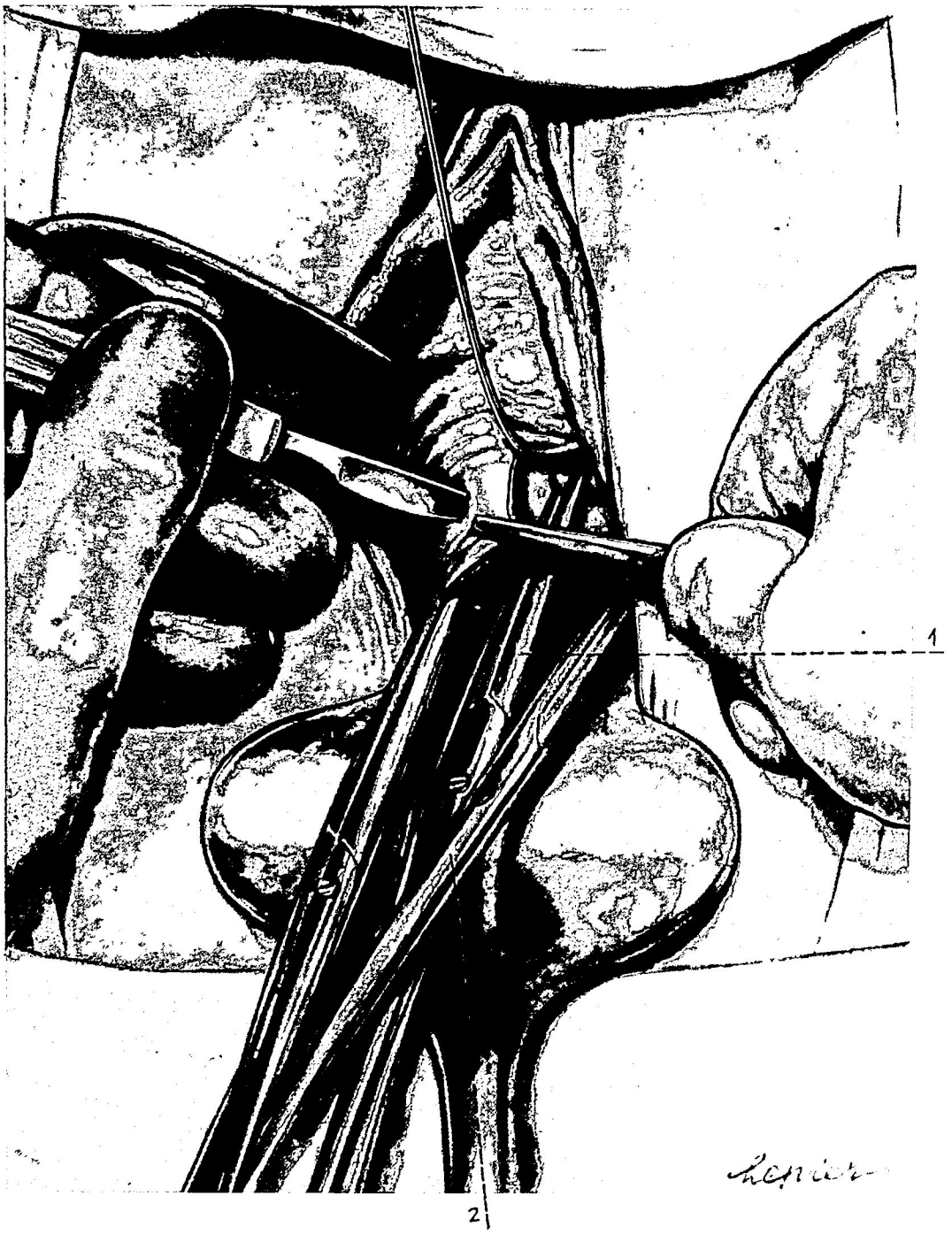

FIG. 108. The right vaginal flap is pierced with a scalpel about 1 cm. away from the margin of the incision in order to pull the right round ligament through it. (1) Clamp at the right round ligament. (2) Clamp at the left round ligament.

FIG. 109. A Kocher clamp enters a small incision in the vaginal flap and grasps the right round ligament. (1) Clamp on the left round ligament.

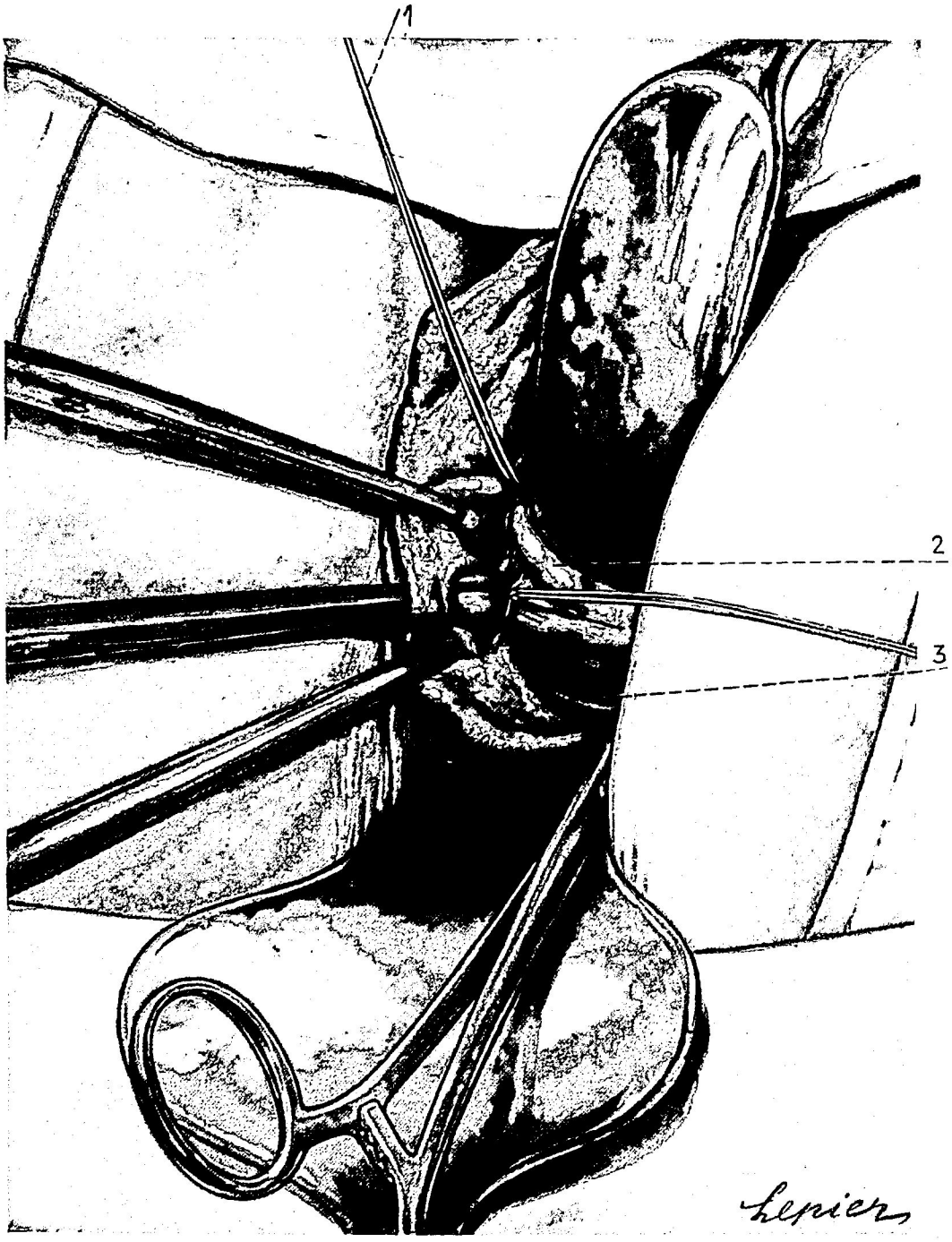

FIG. 110. The right round ligament is drawn through the opening and fixed to the inner surface of the vaginal flap with a silk suture. (1) Rein on the peritoneum of the bladder. (2) Right fallopian tube. (3) Lower margin of the plica.

The anteverted position of the uterus remains unchanged even after repeated deliveries.

Some surgeons have reported unfavorable results from this operation so far as the position of the uterus is concerned. We believe that in the majority of the cases this is due to a false indication. It is a fact that the retroversion is the physiologic position in a hypoplastic uterus with a small anterior wall of the vagina. Such uteri always show a tendency to fall back into their actually normal retroverted position.

An extremely long neck of the uterus might also cause a relapse. Such a uterus cannot find its place in the posterior fornix and always is pushed toward the vulva along the posterior wall by intra-abdominal pressure, thus pulling the uterus back into a retroverted position. In such a case it is best to amputate the cervix.

Another cause of a recurrence is the result of a technical error during the operation. If the bottom holes are made too close to the cervix and not to the urethra it can happen that the body of the uterus will tilt backward around its horizontal axis.

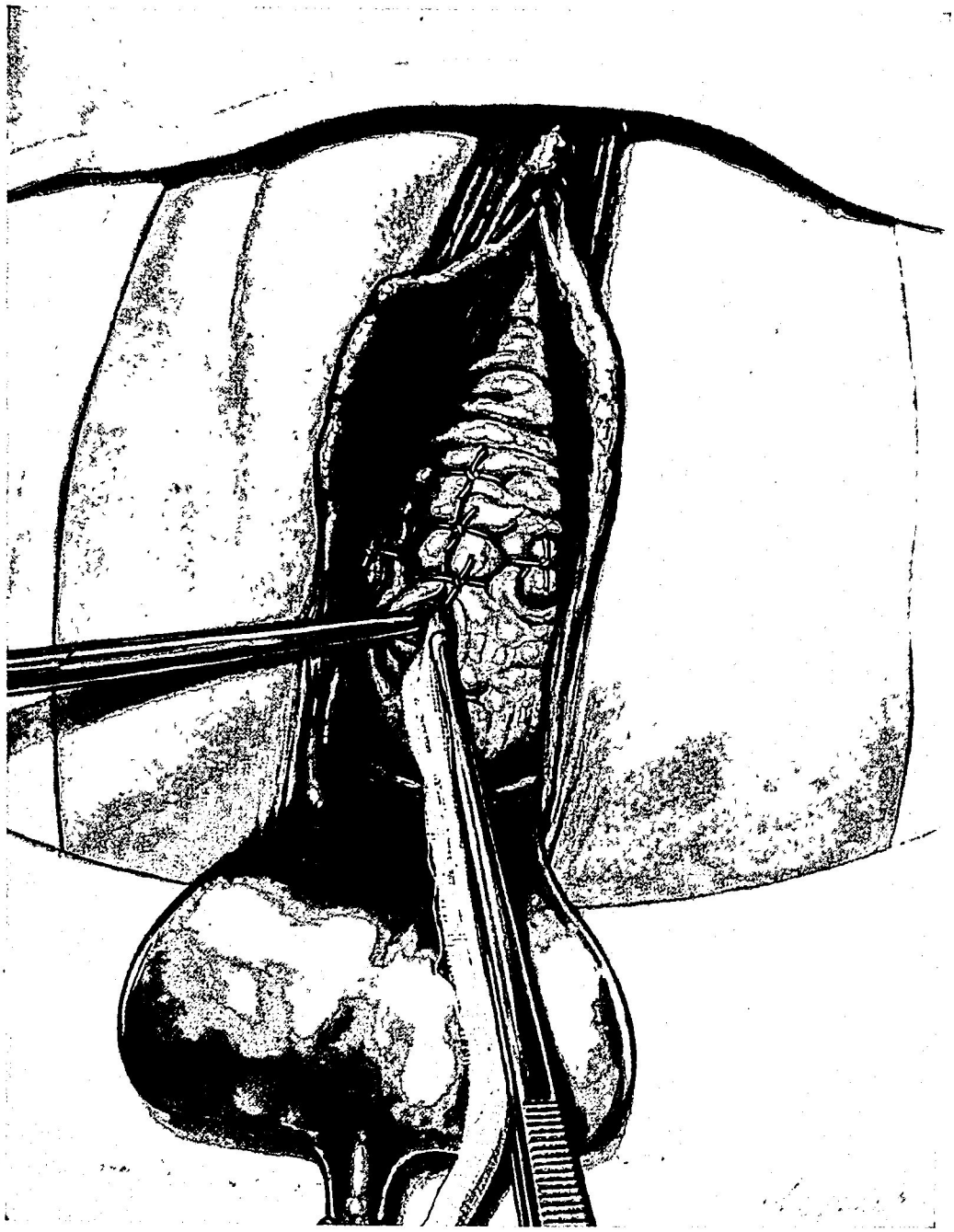

FIG. 111. The colpotomy is closed but for a small opening for the gauze. On both sides the loops of both ligaments sutured individually to the outer side of the vagina are visible.

12

Vesicovaginal Interposition of the Uterus

Vesicovaginal interposition of the uterus is the operation performed for cystoceles, for urinary incontinence and, in some cases, for vesicovaginal fistulas. It is not used for a prolapse. By this operation the body of the uterus is placed between the bladder and the anterior wall of the vagina, which looks as if the bladder is riding on the back of the uterus. Such a position does not allow the bladder to prolapse any more because it comes to be situated on top of the uterus, and the uterus itself finds its hold on the muscles of the levator ani. The uterus has a tendency to return to its physiologic position from the artificial extreme anteversion, and by this action presses the urethra toward the symphysis with the result that the lumen of the urethra becomes narrower. This is exactly the result desired from this operation. In Wertheim's initial cases, his technic began with an anterior colpoceliotomy. Next, the uterus was dislocated into the vagina, and its posterior wall was sutured to the anterior wall of the vagina. The anterior wall of the uterus was left completely nude. It became epithelized after a few weeks, and after some time it could hardly be detected that the scar actually belonged to the uterus. Later, this technic was modified. The anterior wall of the vagina was divided in the mid-line, and close above the cervix a narrow horizontal bar in connection with the underlying bladder was saved (Fig. 112). The vaginal flaps were dissected on both sides; the uterus was pulled out from the celiotomy, pressed toward the bladder and covered with the vaginal flaps. On termination of the operation, the anatomic picture was that of the vaginal flaps being at the anterior side of the uterus and the vaginal bar at its posterior side (Fig. 113).

This operation might lead to a relapse if performed under false indications or if it is done to correct a prolapse of the uterus. After some time either the cervix appears in front of the vulva or the whole body of the uterus with its fundus slips down and appears between the labia in spite of all the maneuvers of an interposition. These are the two usually encountered forms of a relapse of the operation.

To counteract the first-mentioned form of relapse, it was suggested to add to the operation itself the abbreviation of the sacro-uterine ligaments, since the vaginal bar alone was not strong enough to elevate the cervix to a sufficient height. By this modification the neck of the uterus was strongly elevated into the posterior fornix and prevented from coming down. The second form of relapse is due to a faulty technic. Here the body of the uterus was interposed too far away from the symphysis; consequently, it had too much space in which to move, with the result that it finally slipped forward. To counteract this we tried to fix the uterus body to the arcuate ligament by a number of sutures, sometimes using the margins of the levator muscles for this purpose. However, this has some disad-

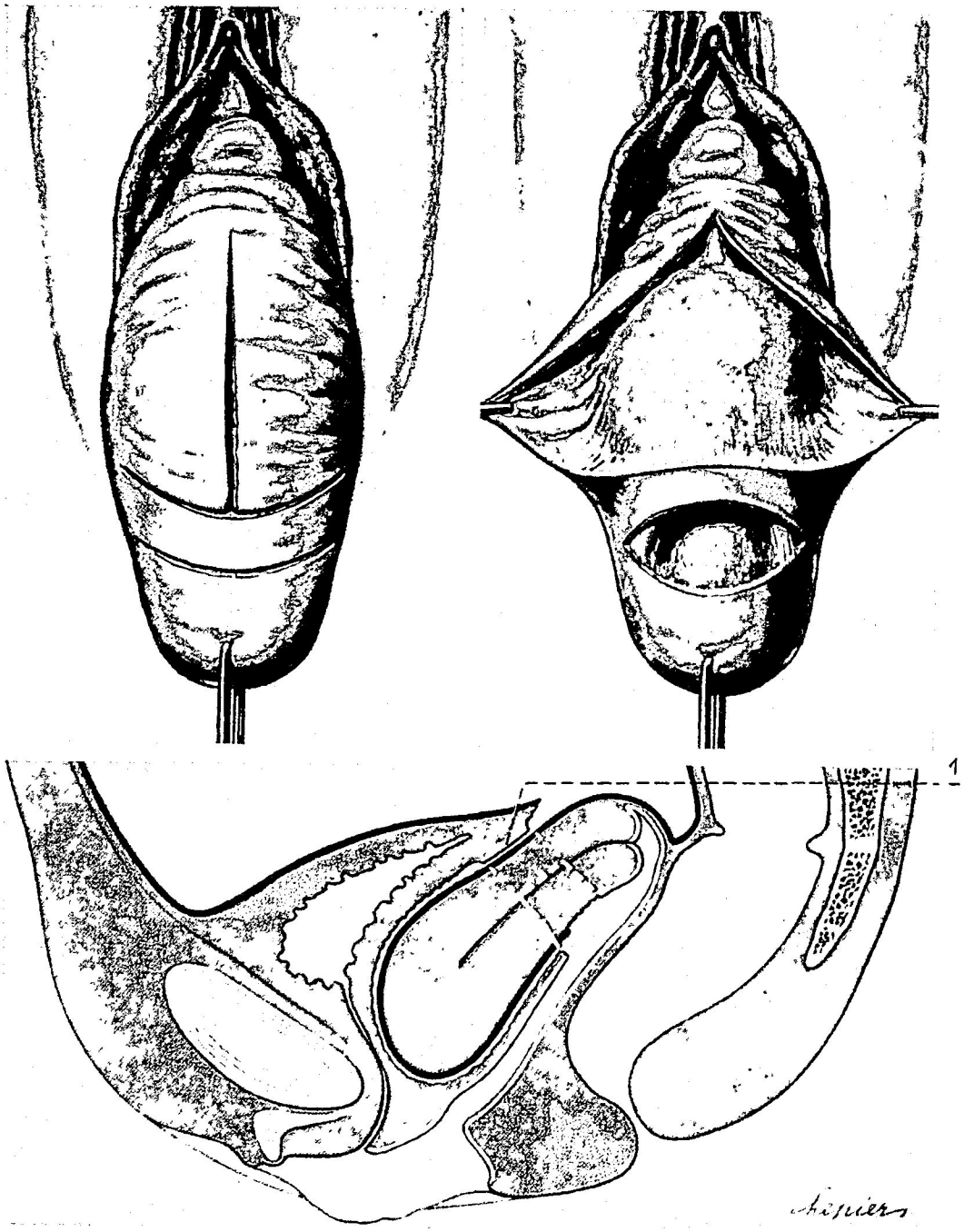

FIG. 112. (*Top, left*) Incision for the interposition with the vaginal bar. (*Top, right*) The vaginal flaps are dissected from the bladder. The vaginal bar has been resected from the cervix in order to open the peritoneal cavity. (*Bottom*) Schematic drawing of a vertical mid-line cut after completion of the interposition with the bar. (1) The vaginal bar. (Wertheim, E.: Die Operative Behandlung des Prolapses mittelst Interposition und Suspension des Uterus, Berlin, Springer)

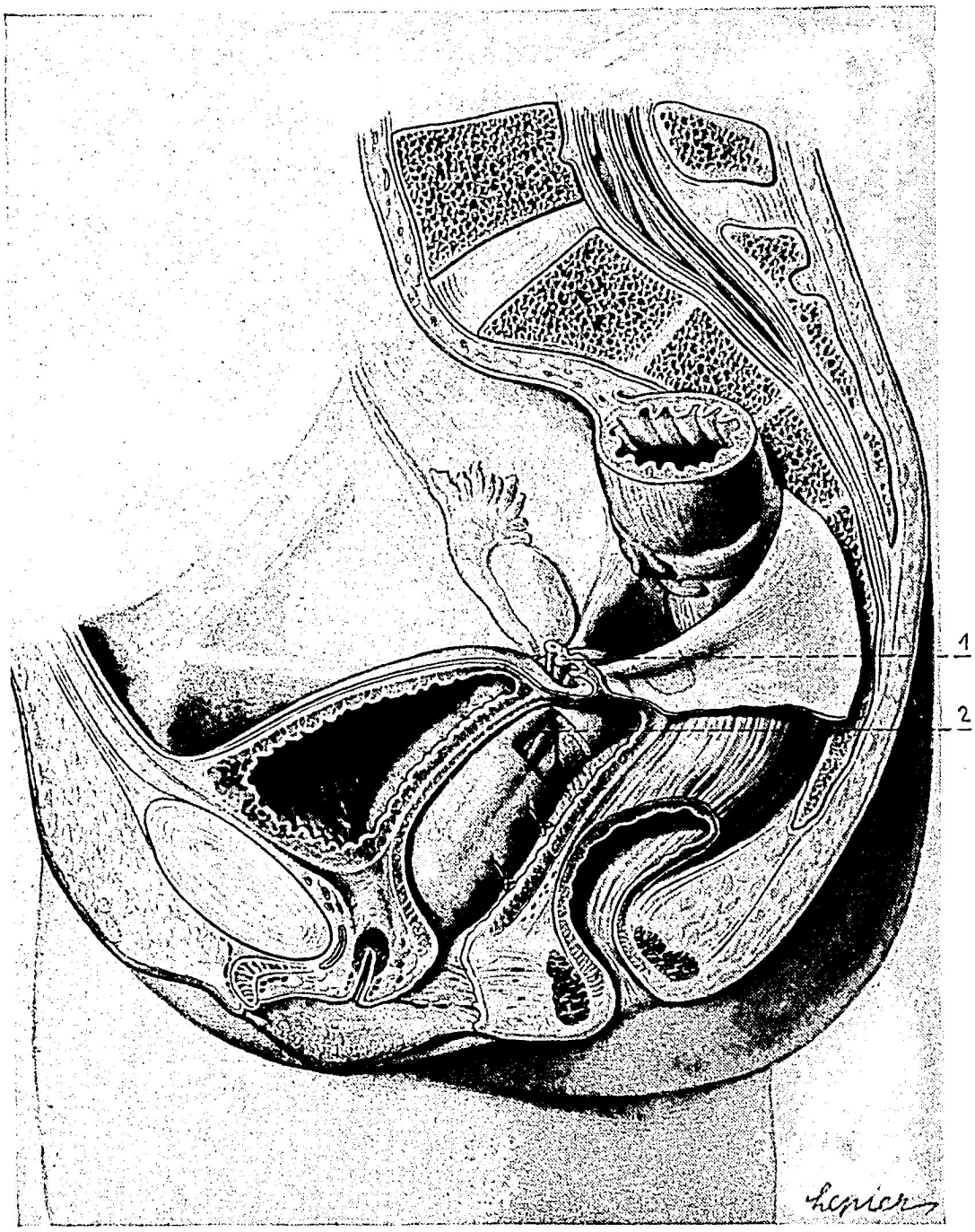

FIG. 113. Artist's conception of the status after the interposition with the bar. For better visualization the left adnexa are not shown. (1) Stump of the detached left adnexa. (2) Junction of the vaginal bar. (Wertheim, E.: Die Operative Behandlung des Prolapses mittelst Interposition und Suspension des Uterus, Berlin, Springer)

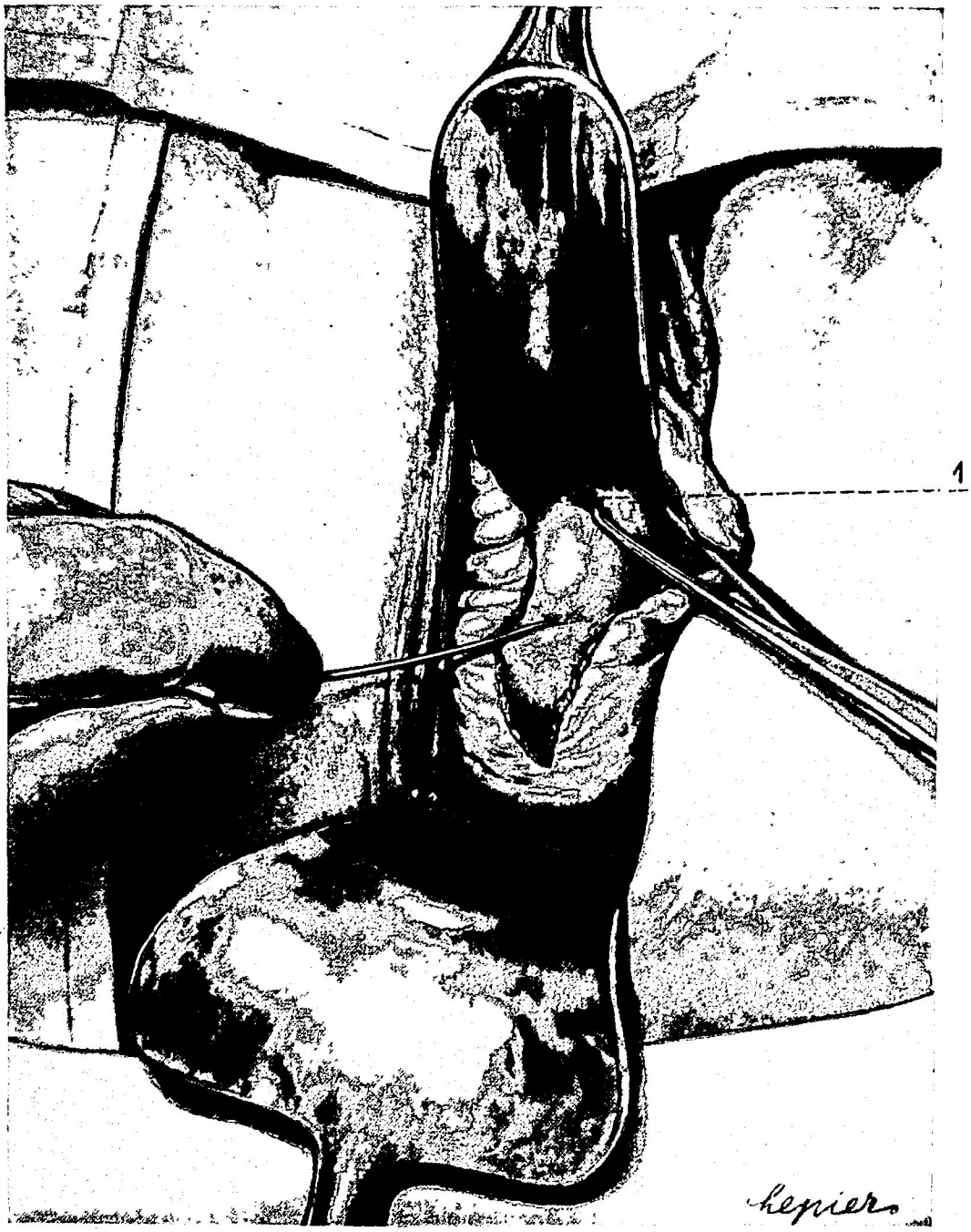

FIG. 114. Anterior mid-line colpotomy. The fundus has been reached by proceeding up the anterior wall of the uterus with the one-toothed hook. This rotates the uterus down into the vagina. (1) Fundus of the uterus.

vantage. The uterus loses its flexible mobility and is no longer elastic enough to move freely toward the urethra.

If we limit the interposition operation to only clear-cut cases of cystocele and incontinence, we need neither the vaginal bar nor the abbreviation of the sacrouterine ligaments. The uterus is sutured in between the bladder and the anterior wall of the vagina. Today this procedure is known as the modified interposition operation.

The steps of this operation are as follows. The anterior lip of the cervix is hooked onto a tenaculum, pulled down, and a curettage is done. The cervix is amputated if the neck of the uterus appears to be too long. A vertical anterior incision is made in the vagina, and the vaginal flaps are dissected from the underlying tissue to a greater extent. The bladder is dissected from the cervix, and the peritoneum is opened. The next step is to proceed up the anterior wall of the uterus with the hook until the fundus is reached; there a tenaculum is inserted (Fig. 114). This permits the uterus to be dislocated into the vagina (Fig. 115). The peritoneum is fixed immediately to the posterior wall of the uterus at the height of the inner os. Such an extraperitoneally placed uterus obviously is incompatible with a natural delivery of a baby. Therefore, as a compulsory step of this operation, we have to sterilize all women who have their regular menstruations. The sterilization is done best with the Madlener instrument and the resection of the crushed part of the fallopian tube. The ligature is placed into the crushing furrow (Fig. 116). Next, there follows a step by which the uterus is moved into its final bed between the bladder and the vagina. This is accomplished by a sliding movement (Fig. 117), using the tenaculum in the uterus as a grip. Next, the fixation of the uterus follows. Two silk sutures run along the left wall of the vagina, the anterior wall of the uterus and finally the right wall of the vagina. An excess of vaginal mucosa may be trimmed accordingly (Fig. 118). The sutures must not be laid at the fundus but have to be inserted through the anterior wall of the uterus body in order to place the fundus not only underneath the symphysis but also partly behind it. The wound is closed except for a small opening into which a gauze drain is introduced. The drain is removed the following day (Fig. 119). It is obvious that an extensive colpoperineorrhaphy has to be performed as the final step of this operation.

The modern viewpoint regarding this operation is that it should not be used in elderly women who are beyond the menopause. The small, atrophic uterus would not show sufficient tendency to return to its physiologic position but rather would withdraw from the symphysis, owing to its shrinking process.

Also, very large uteri are not suitable for the interposition operation because they would displace the adjacent organs too much. Most suitable for this operation is the uterus of approximately normal size that would snugly fill the bed of the interposition and prevent the bladder from descending.

An indwelling catheter is inserted only in those women who, also under normal conditions, are unable to urinate spontaneously while lying in bed.

Vaginal douches are started 8 days following the operation. Six weeks later, the patient is placed on the examining table, and the silk sutures are removed.

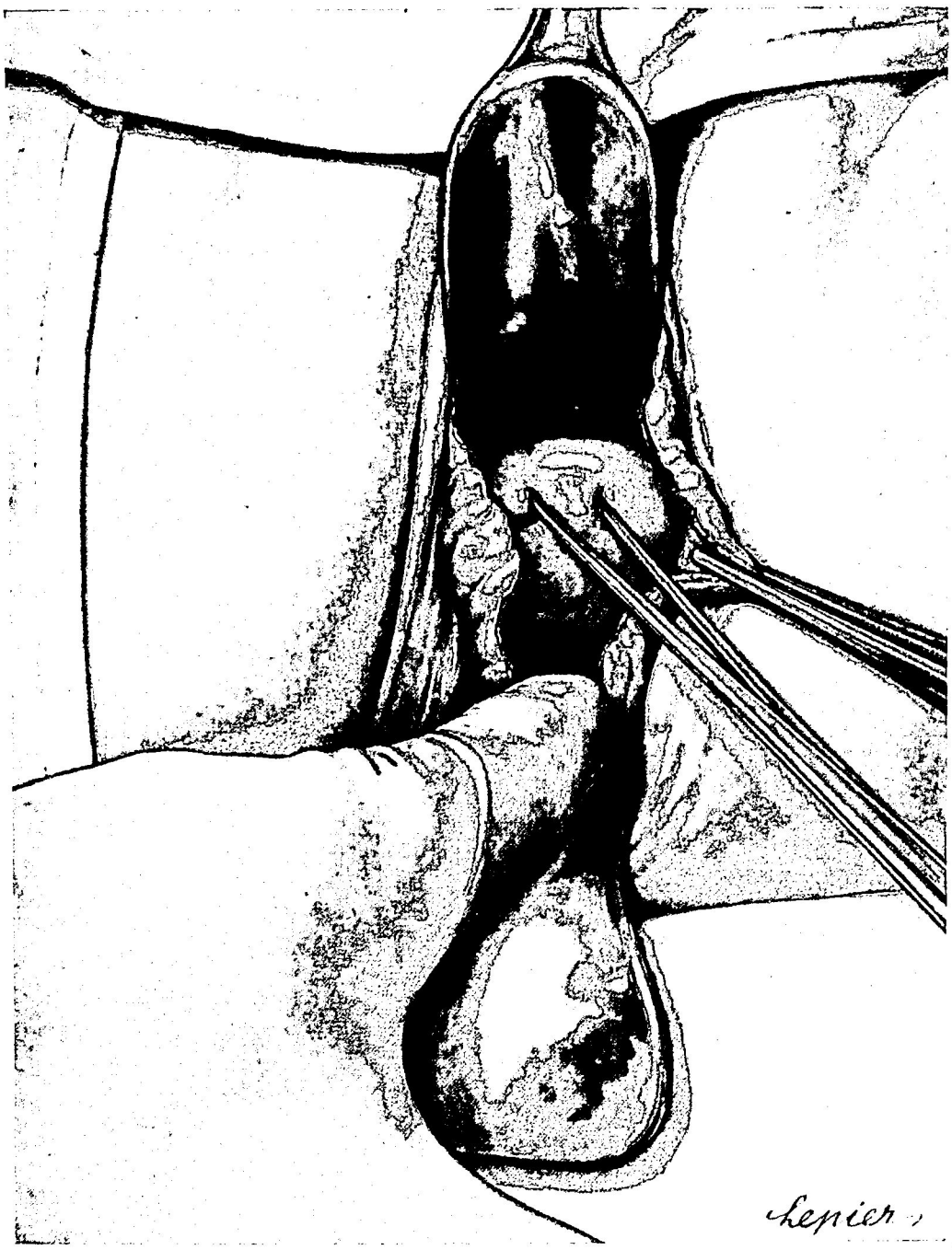

FIG. 115. The uterus is being drawn into the vagina with a tenaculum while the left index finger pushes the cervix into the posterior fornix. This helps the uterus to rotate in front.

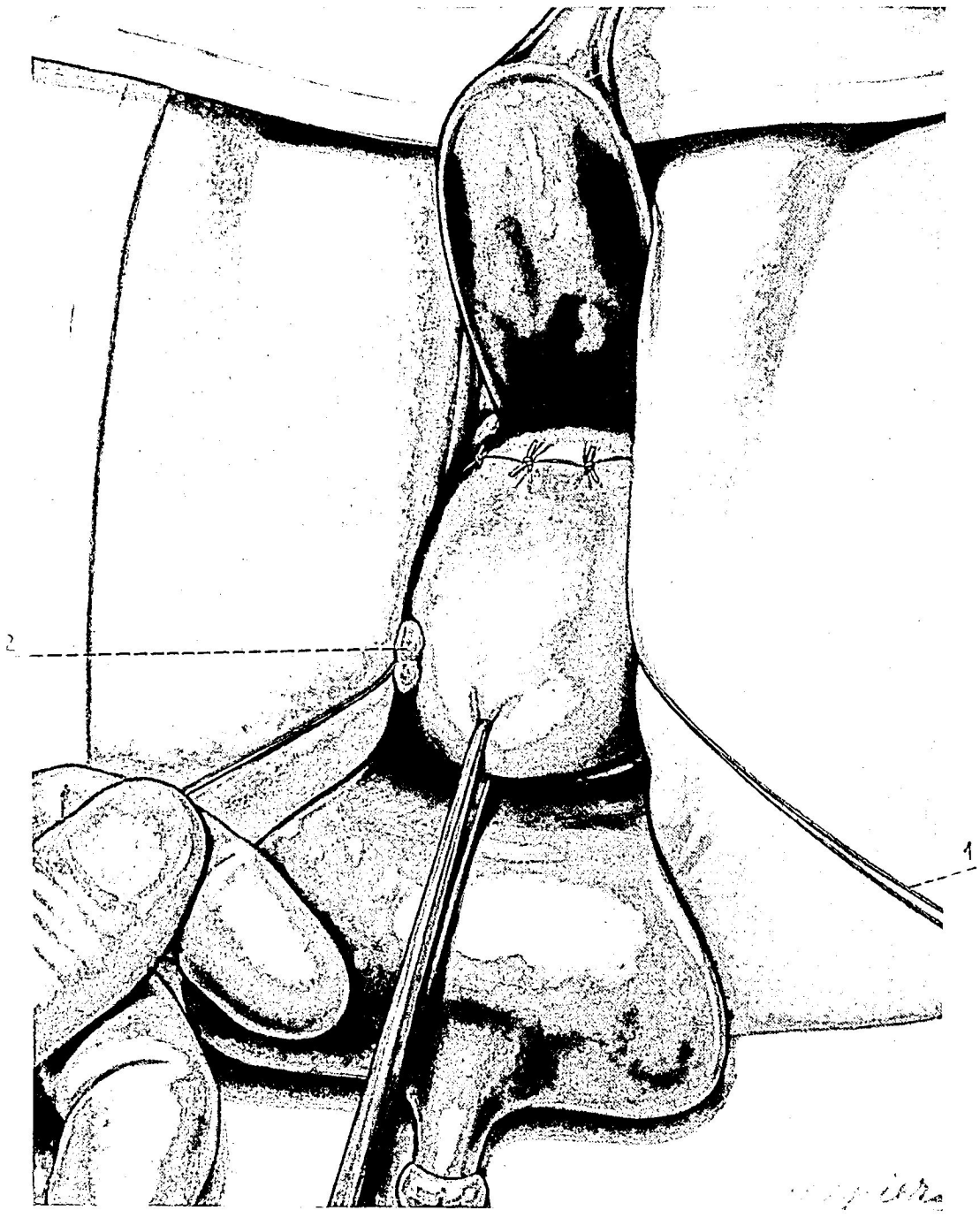

FIG. 116. The uterus is in extreme anteversion in the vagina following the resection of the fallopian tubes. The peritoneum of the bladder is sutured to the posterior wall of the uterus. (1) Rein on the stump of the left adnexa. (2) Stump of the right adnexa.

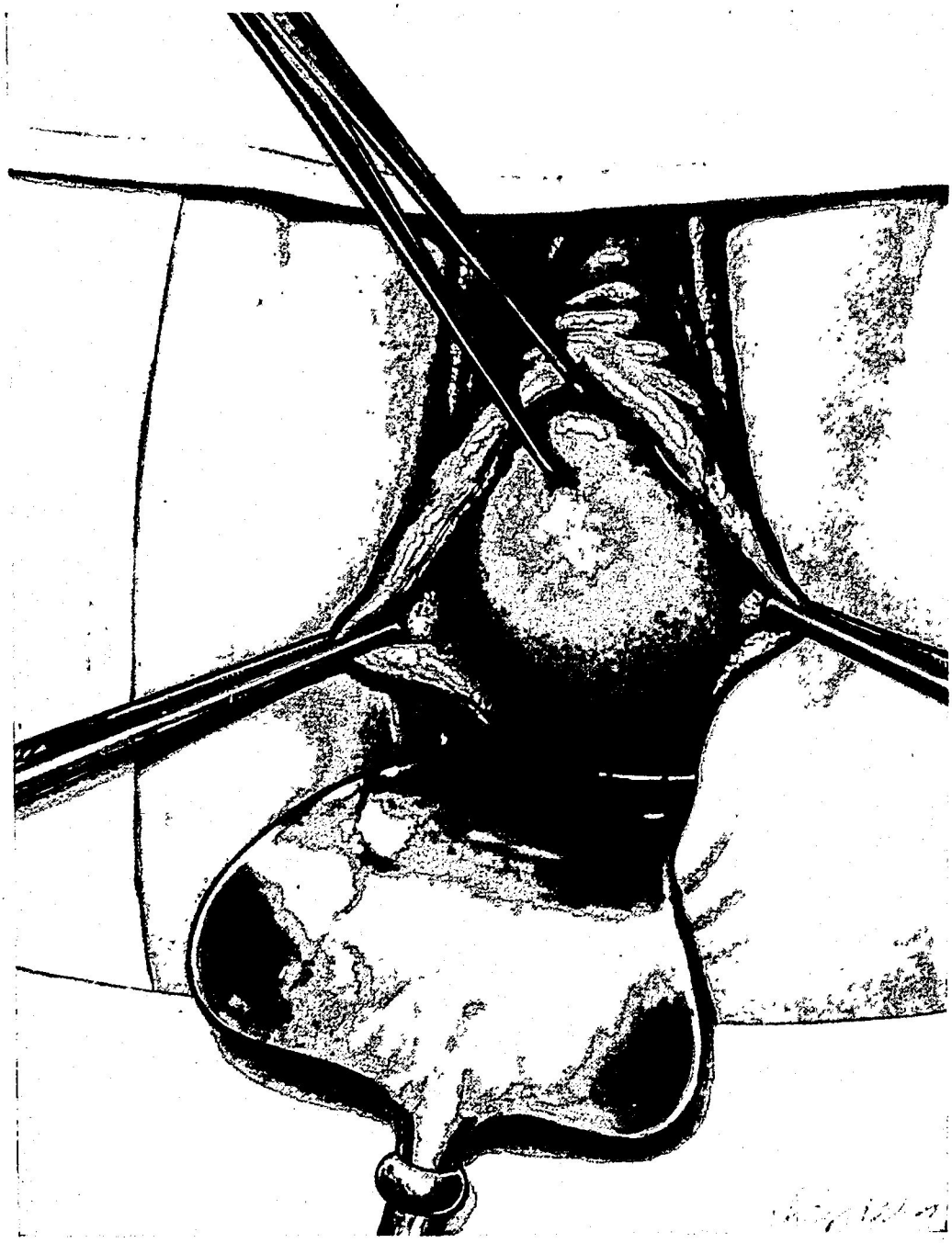

FIG. 117. The uterus is being forced into the bed of the interposition.

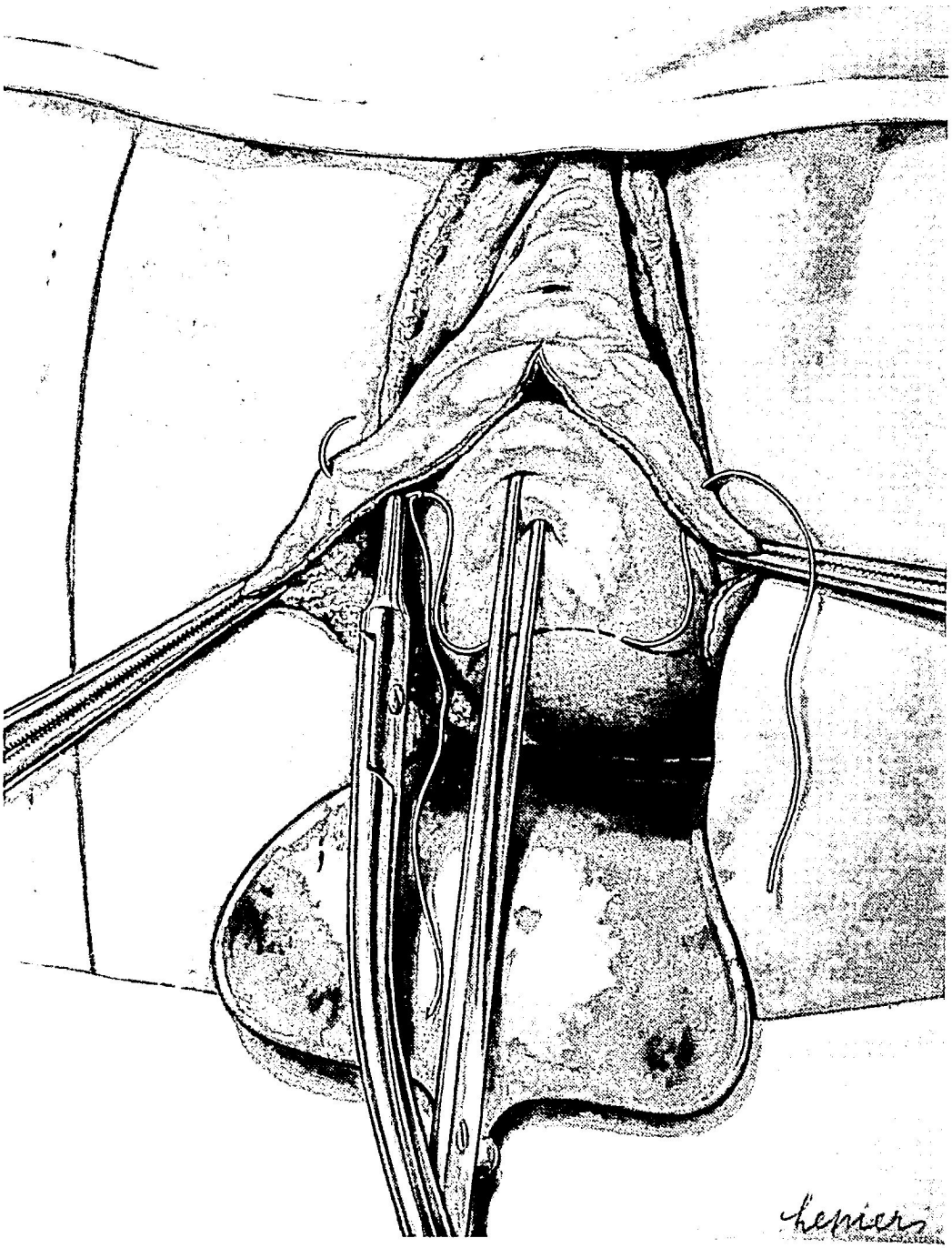

FIG. 118. The application of the interposition suture clearly demonstrates the position of the uterus after the sutures have been made. The uterus becomes elevated toward the urethra.

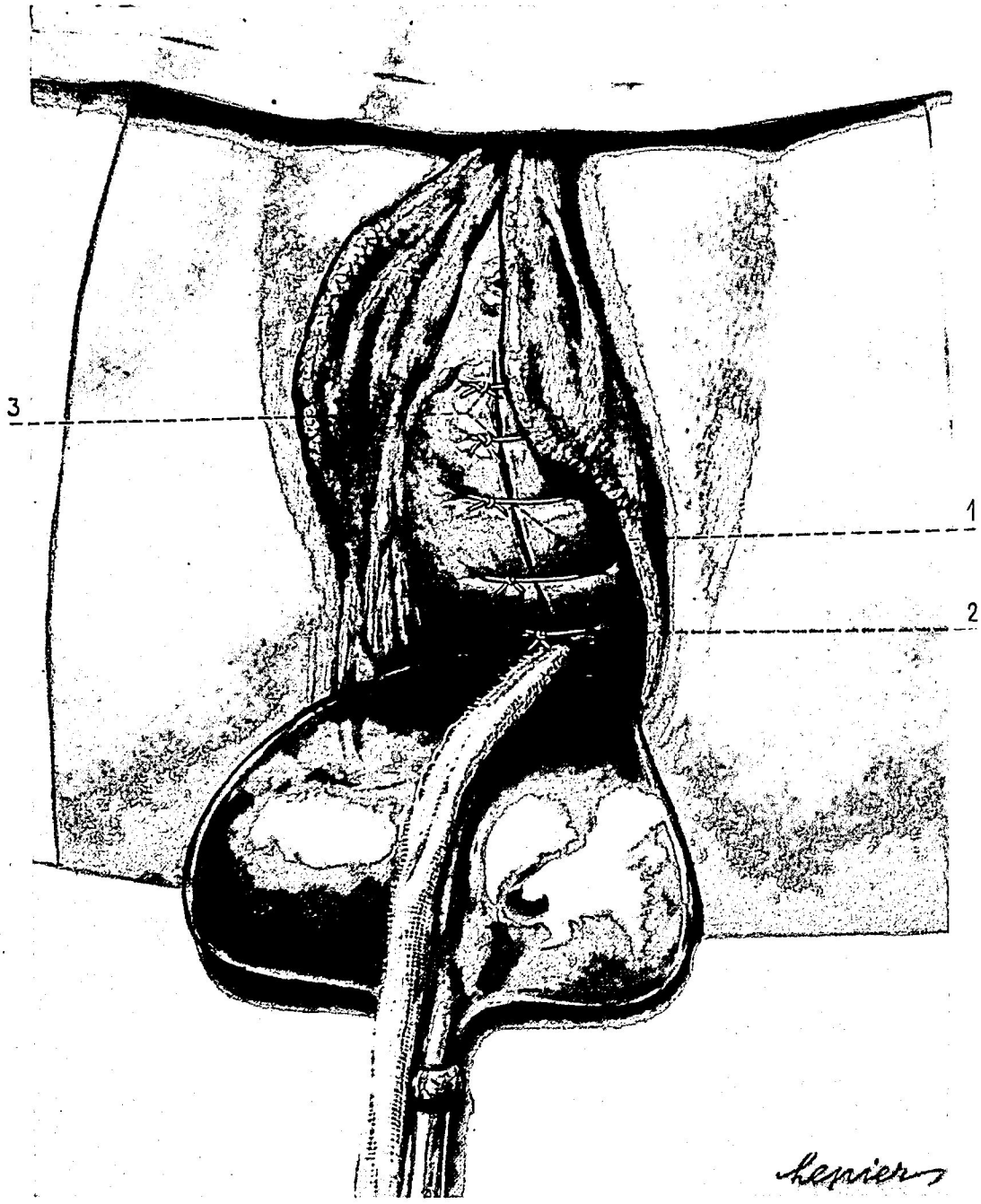

FIG. 119. The operation is completed; a gauze drain is introduced between the uterus and the vagina. (1) Sutures of the interposition. (2 and 3) Colpotomy sutures.

13

Incision and Drainage of an Abscess from the Posterior Fornix

As was pointed out repeatedly in former chapters, for a chronically diseased genital organ that has resisted successfully any treatment, only a radical operation should be performed, especially if the woman is close to the menopause. We select, if possible, an afebrile period for the performance of such an operation.

Acute cases, even with high temperatures, only rarely compel us to operate. The operation in these instances consists of only the incision and the drainage of accumulated pus. Usually we have to deal with patients whose temperatures have remained high in spite of all therapeutic measures, the sulfonamides and the antibiotics included. The reasons for the failure might be that the drugs lacked the required broad spectrum or that the diseased organs were walled off by thick membranes that prevented the drugs from coming into contact with the organs themselves; thus the drugs are unable to exert their beneficial power. As a rule, this happens in cases that show acute exacerbations in chronically diseased adnexa of long-standing duration or in cases of purulent ovarian cysts.

The incision of a tumor of the adnexa through the vagina almost always leads to the formation of a fistula. In the end this requires a hysterectomy. Therefore, our decision for an incision is guided by the dangers that patients might encounter if the temperatures remain high for a long period and are resistant to any treatment or when a state of amyloidosis is faced; in other words, if the persistence of the purulent process endangers the patient's life.

For the performance of the operation the patient is placed in the lithotomy position. The vagina is separated, and the posterior lip of the cervix is grasped in 2 tenacula and drawn high up toward the symphysis. Next, the posterior wall is incised horizontally over the Douglas peritoneum. The tenacula and the specula are removed, and a closed sponge forceps is introduced into the vagina. Two fingers of the surgeon's left hand guide the forceps in. The fingers will lead the tip of the forceps through the vaginal incision until the lower pole of the tumor is reached. The external hand exerts some counterpressure. The slightly elevated shaft of the introduced forceps perforates the Douglas peritoneum, thus landing in the tumor. The external hand must not move too much; its only task is to hold the tumor in place. Otherwise, adhesions that have been formed as a protection toward the free peritoneum might rupture (Fig. 120). The discharge of the pus is facilitated by spreading the forceps. A rubber drain is introduced and left in situ as long as the secretion is there. Such a maneuver will enable us to reach even highly located purulent sacs and open them with safety. Any other

FIG. 120. A sponge holder is introduced through the posterior colpotomy to the lower pole of the tumor under guidance of 2 fingers of the left hand. The tumor is fixed by the surgeon's right hand. The handles of the sponge holder are supported by the abdomen of the surgeon. (1) Posterior colpotomy. (2) Pus-containing sac.

method is unsafe, time-consuming and dangerous, since injuries to adjacent organs might not be avoided.

The differential diagnosis between a tumor of the adnexa and a parametrane exudate located high in the pelvis which does not reach the vagina is very difficult. Also, the differential diagnosis of an ovarian cyst is hard, particularly when the cysts are very high and difficult to reach with the examining fingers. However, the operation remains the same. In most cases of a parametrane exudate a complete healing can be expected without formation of a fistula.

Abscesses in the Douglas pouch are treated in the same manner. Here, too, the presence of fluctuation indicates that an active procedure is required. The diagnosis in such cases is facilitated by the presence of a mucous discharge from the rectum, an edema of the rectal mucosa and by some tenesmus and paresis of the sphincter ani.