CHAPTER VIII.

VAGINAL HYSTERECTOMY.

Summary.—Technic (pre-operative precautions, operation, postoperative precautions).—Operative difficulties.—Complications.—Various procedures (Doyen, Péan, Segond, Müller, Quénu, J. L. Faure).—Operative modifications according to the lesion (cancer, fibromata, inflamed adnexa, puerperal infection, prolapse, uterine inversion, juxta-uterine tumors).

The first surgeon to excise the uterus with success by the vaginal method was Sauter of Constance (1822). He operated without forceps or ligatures and yet his patient was cured. In 1829 Recamier did the same operation, but ligatured the uterine arteries. Unfortunately the high mortality made the operation fall into oblivion, from which it was restored to the light by Czerny, who on the twelfth of August, 1878, did a vaginal hysterectomy for cancer of the cervix. At first, vaginal hysterectomy was reserved for this affection. Its indication, however, soon became more extended.

Thanks to Pean firstly, to Segond, Richelot and latterly to Doyen, vaginal hysterectomy was applied in a systematic fashion to treatment of the adnexa, and then to fibromata.

Its operative technic has been considerably simplified owing to the introduction of forcipressure and to morcellement.

Among numerous operative procedures which were successively utilized, we should give a place apart to that of Doyen to whom is due the merit of introducing a technic so simple and so rapid as to vulgarize vaginal hysterectomy.

In spite of the operative perfection and the excellence of the results, vaginal hysterectomy, having had a very considerable vogue in the treatment of inflammation of the adnexa, fibromata and cancer, has lost much ground and tends more and more to be replaced by abdominal hysterectomy.

1. Operative Technic.

Preparatory Precautions.—Vaginal hysterectomy renders certain pre-operative precautions necessary which it is important not to neglect. Several days before the operation the patient

FIG. 222.—Short vaginal speculum.

FIG. 223.—Long and narrow speculum.

will take large vaginal injections twice daily. Give a purge the night before the intervention.

Before operating look to the toilet of the vagina and vulva. This is a lengthy and minute operation. The vulva should be

FIG. 224.—Museux's heavy forceps.

completely shaved; wash with soap not only the external parts but also the vagina itself.

The following is a list of instruments required:

Several vaginal specula, one about 5 or 6 cm. long, to

press down the fourchette, two ordinary vaginal specula, two long and narrow specula about 35 mm. long in order to protect the bladder, some tampon holders, six pairs of Museux's strong forceps to draw the uterus down, one hysterometer, one bistoury, some straight and curved scissors, pressure forceps, one pair of tenaculum forceps, some Kocher's forceps, two ring forceps to draw on the adnexa and eight pairs of short and powerful pressure forceps.

The relative position of the operator and his assistants is the same as for all vaginal operations.

Two assistants are indispensable; one is placed to the right and the other to the left.

The instruments are to the right of the operator.

In order to avoid any sepsis the operative field should be extensive. It is important to fix the posterior compress so as to conceal the anus. Three little tenaculum forceps are dis-

FIG. 225.—Short and strong artery forceps.

posed so that one is on a line with the fourchette, and two others over the buttock; fix this compress and in order to be quite sure of the fixation allow them to take up at the same time a little fold of the subjacent tissues.

The bladder is emptied with a catheter.

Operation.—The operation should then commence.

The fourchette being pressed down by the short speculum, the cervix is seized with two pairs of traction forceps inserted into the anterior lip near the commissures. The hold should be firm; the uterus, by slow and progressive traction, is drawn down to the vulva (Fig. 226). Holding the two forceps in the left hand the operator, with scissors or a knife, held in the right hand, makes a circular incision of the cervix. The majority of surgeons make a circular incision. We believe with Segond,

that it is of benefit to add to this circular incision two small lateral ones.

If the knife is used, the incision is performed in the following manner: Two little retractors are placed in the lateral fornices. The assistant to the right of the patient commences by strongly

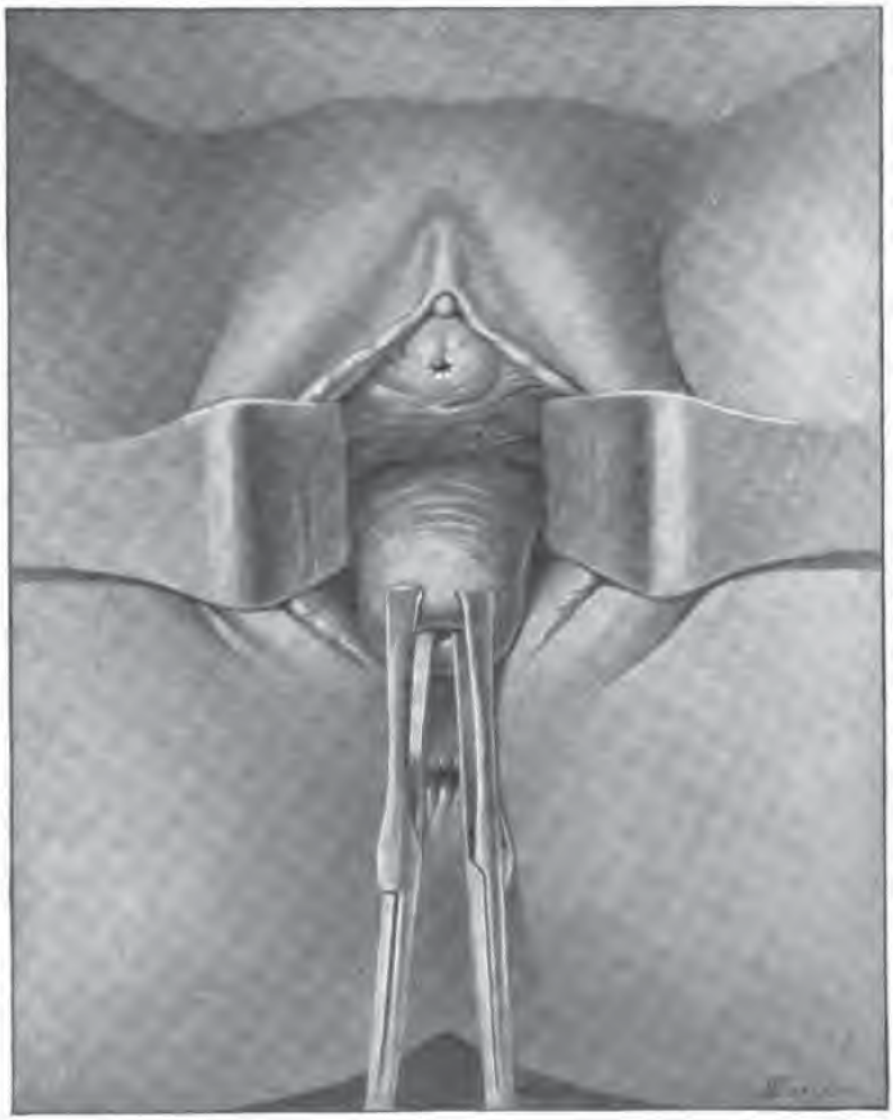

FIG. 226.—The uterus is drawn down with two of Museux's heavy forceps; the vaginal walls are drawn back with retractors.

pressing down with his retractor the corresponding vaginal wall while the surgeon with his left hand draws the cervix strongly toward the left. The fornix is thus well exposed and stretched. Taking the bistoury, the operator commences the incision in

this fornix about 4 cm. from the right commissure. This incision is directed at first transversely toward this commissure but when the bistoury is about 1 1/2 cm. from it the instrument is directed forward and cuts through the anterior fornix on the cervix. During this procedure the cervix is drawn toward the right. The left retractor now plays its role in that it permits of the knife

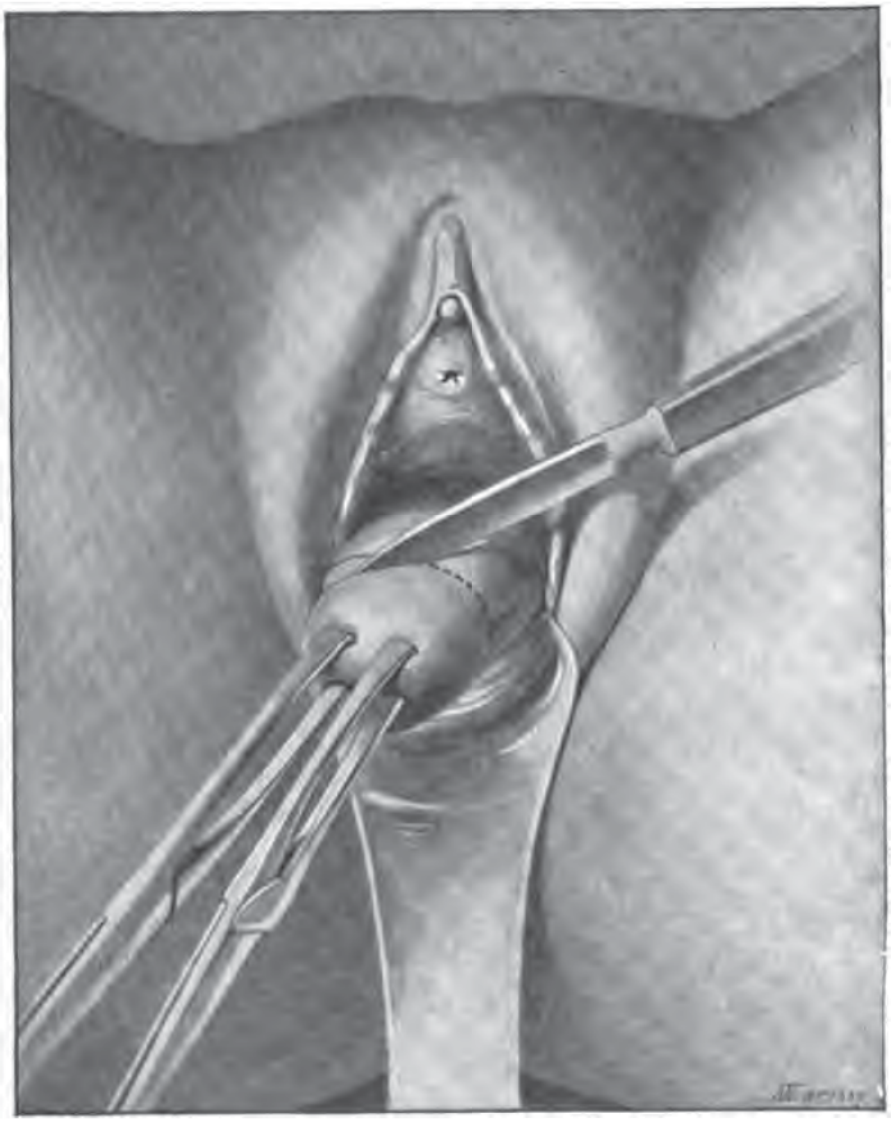

FIG. 227.—Circular incision of the cervix with lateral incisions.

in making a short lateral incision in the left fornix symmetrical with that on the opposite side.

In inserting a posterior speculum and in drawing the cervix forward, one is enabled to circumscribe the cervix by tracing

a curved incision posteriorly, and then proceeding toward the front about 1 1/2 cm. from the external os[1] (Fig. 228).

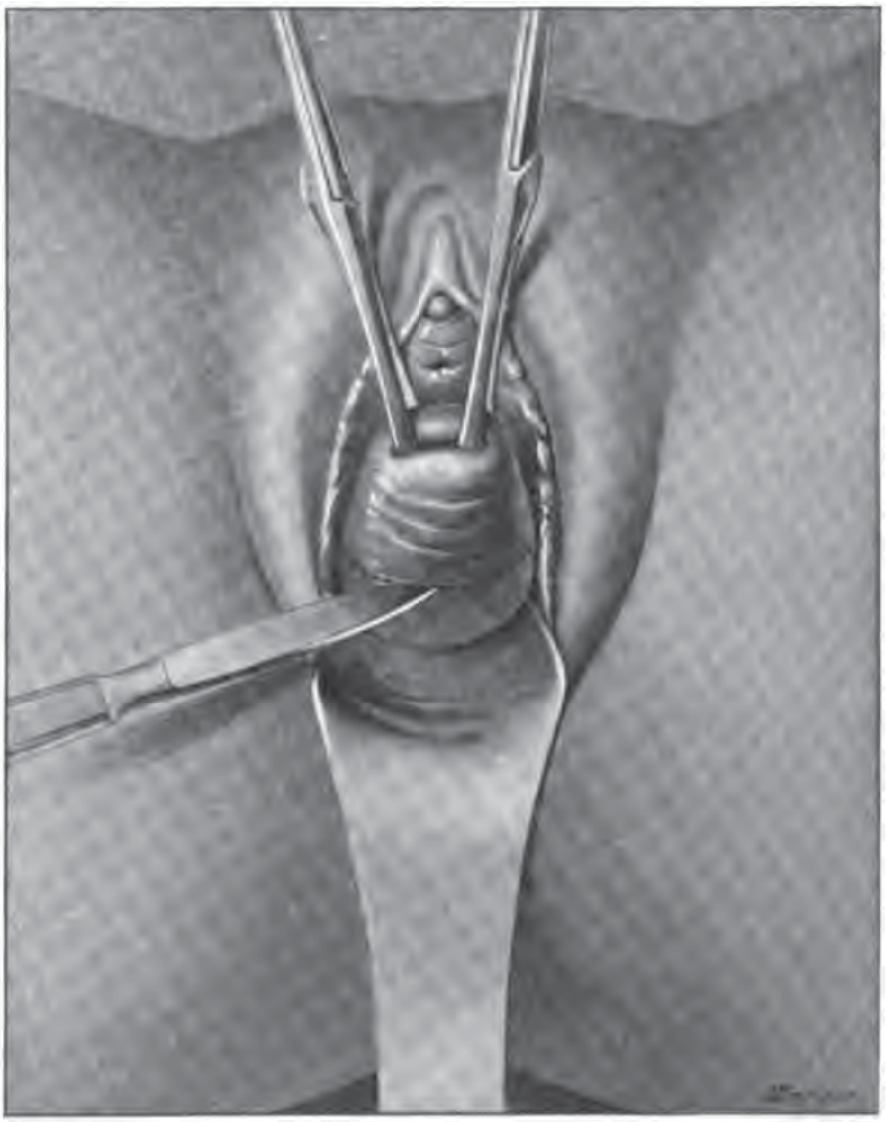

FIG. 228.—Posterior part of the circular incision of the cervix.

The danger is the bladder; by keeping about 15 to 18 mm. from the cervix there is nothing to fear. In case of doubt regard-

[1] Some operators prefer to attack the vagina with strong curved scissors. The cervix should be assailed on its posterior right face. The left hand drawing on the forceps pulls it forward and the scissors cut into the right of the cervix (to left of the operator) about 2 cm. from the external os and with some few cuts sever the posterior vaginal portion; often the pouch of Douglas is opened in this manipulation, but it is of no importance. When the scissors is on the left side of the cervix, the left hand manipulates in such a way as to expose clearly the lateral surface, then the anterior surface of the cervix and the scissors circumscribe the cervix by cutting through the insertion of the vagina; their extremity, applied to the uterus, severs gradually the anterior insertion of the vagina and then goes to the left of the operator to unite with the first incision at its starting point. The disinsertion of the vagina is finished (J. L. Faure).

ing its limits there is nothing simpler than to introduce a sound so as to accurately determine its limits.

The cervix thus circumscribed should be freed. Commence by opening the posterior fornix. To do this, the cervix being carried forward, the index-finger is forced between the lips of the posterior part of the vaginal incision and endeavors to burst through the peritoneal cul-de-sac. If this is free, the action is easy

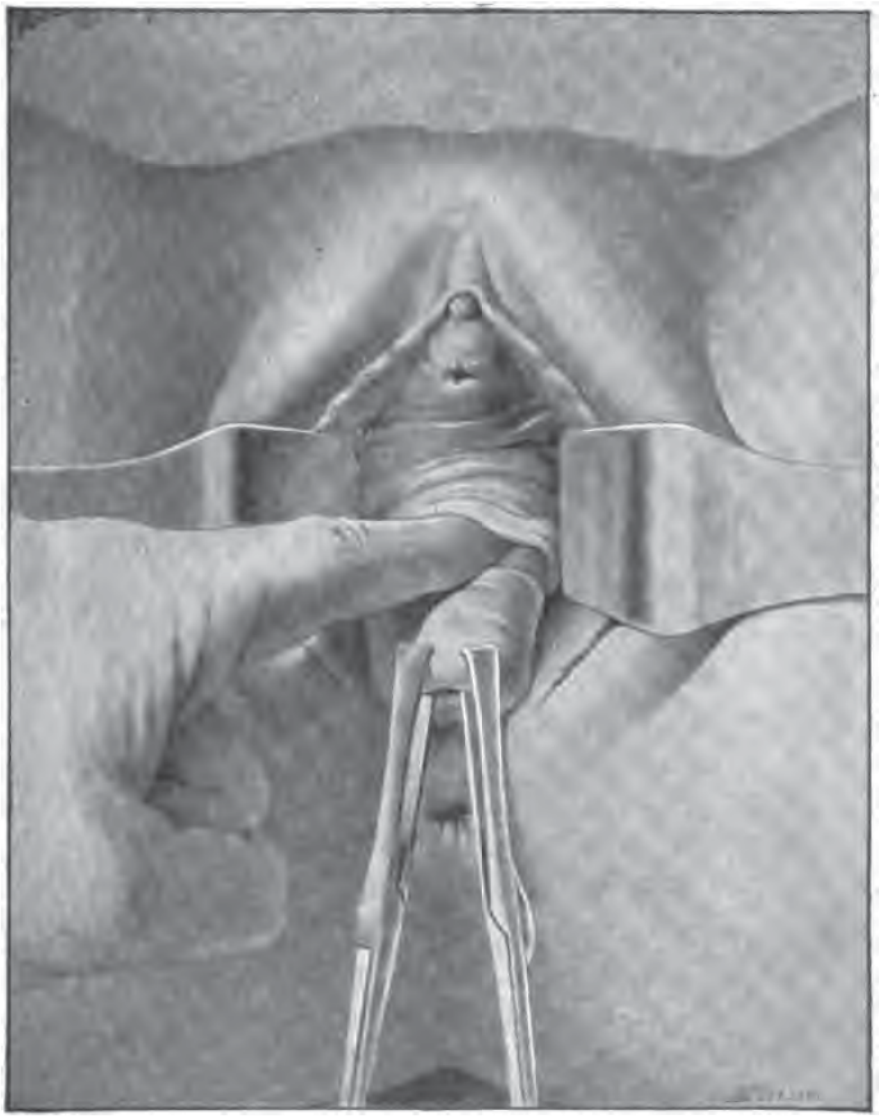

FIG. 229.—Separation of the bladder.

and the finger soon feels as if it were in a cavity, where it feels intestinal loops or even prolapsed adnexa.

If the cul-de-sac is full of adhesions the peritoneal cavity is difficult to find. It is in these cases that we must proceed me-

thodically. The index-finger ought not to lose the contact of the posterior surface of the uterus, which is the best of landmarks. It feels its way along the length of this surface until it reaches the level of the fundus. In complex cases it happens sometimes that in this little manipulation one or more suppurative foci are opened.

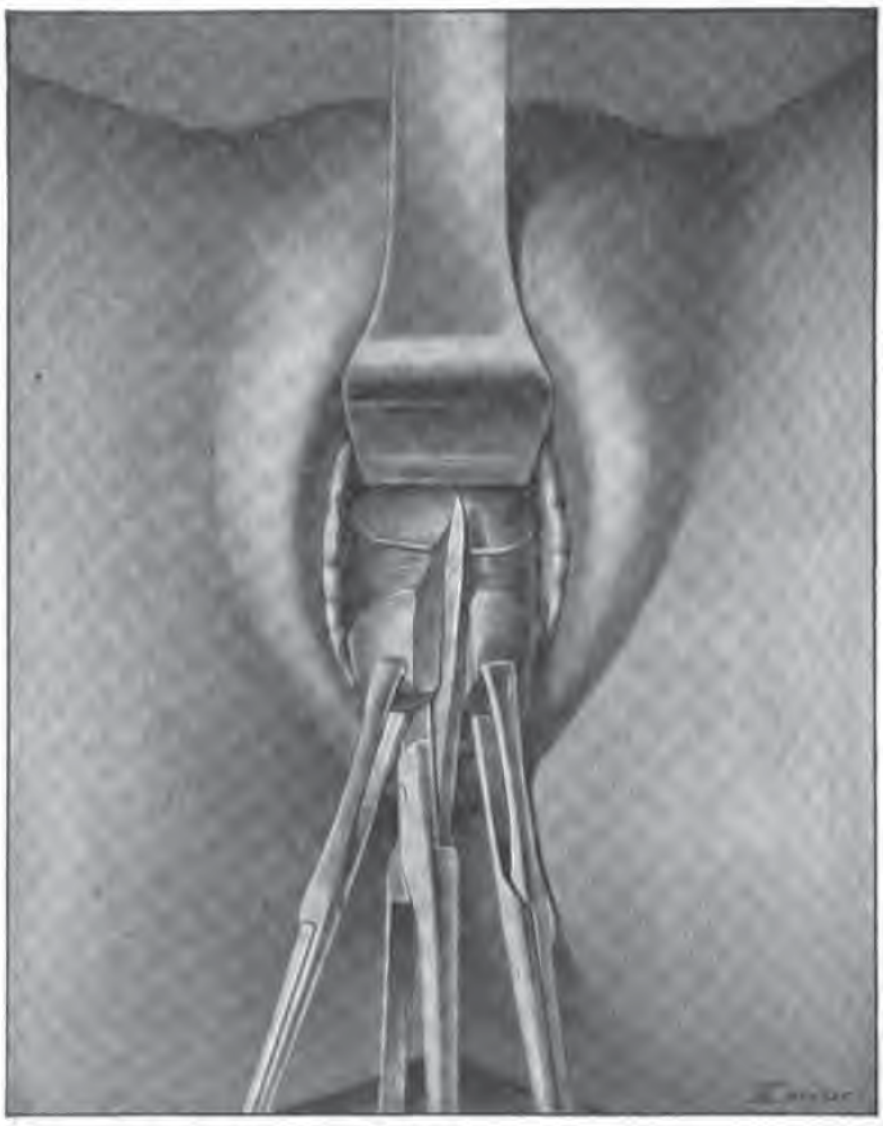

FIG. 230.—Median anterior hemisection of the uterus.

The uterus is freed behind and now it must be freed anteriorly. To do so, carry the cervix down and back toward the fourchette, separate the bladder with the right index-finger (Fig. 229) or with blunt curved scissors which may be used to press

back the tissues and also to cut through the parts which resist the separation.

Above all, at the level of the median line adhesions are most marked, as we have already had occasion to observe when describing anterior colpotomy.

The separation of the bladder should be very complete. It is carried out as extensively as possible laterally in order to separate the ureters from the operative field.

In the course of these manipulations the vesico-uterine cul-de-sac is often opened. If it is not, it may be recognized by its white color, which differentiates from the neighboring cellular tissue and may be opened by a single cut of the scissors.

When the uterus does not descend well and the peritoneal cul-de-sac is not to be seen, we should proceed without waiting to the next stage: *Anterior hemisection of the uterus* or median section of the anterior wall as recommended by Doyen (Fig. 230).

This hemisection is done in the following manner. Two traction forceps are placed at the level of each of the commissures of the cervix. The posterior limb of a pair of straight blunt scissors is introduced into the cervical cavity and the anterior wall is cut through as far as the isthmus, or even a little higher, remembering always to follow exactly the anterior median line. This cut does not bleed. On each lip of the incision, as high as possible, place a pair of traction forceps.

By drawing on these forceps, which hold the uterus very firmly, its anterior face is sensibly depressed and at the same time a slight anterior flexion is imparted to the organ.

A new part of the uterus, not incised, now appears. Taking the scissors again, the surgeon cuts through all the visible portion of the accessible anterior face. A third pair of traction forceps is placed on one of the lips of the incision above the first pair (Fig. 231). This pair may then be taken off and reattached on the most elevated portion of the opposite lip of the same incision.

One ascends thus toward the fundus of the uterus, in a sense making the traction forceps climb the anterior median incision which the operator continues to prolong. This progressive ascension of traction forceps brings about a more and more marked tilting of the body of the uterus. In the meantime the vesico-uterine cul-de-sac has been opened; a long and narrow speculum

is introduced into its cavity, protecting the bladder and pressing back the loops of intestine which tend to descend. When the median anterior incision approaches the fundus of the organ and the traction forceps are inserted very close to this point, tilting of the uterus occurs and the body is turned completely inside out into the vagina (Fig. 232).

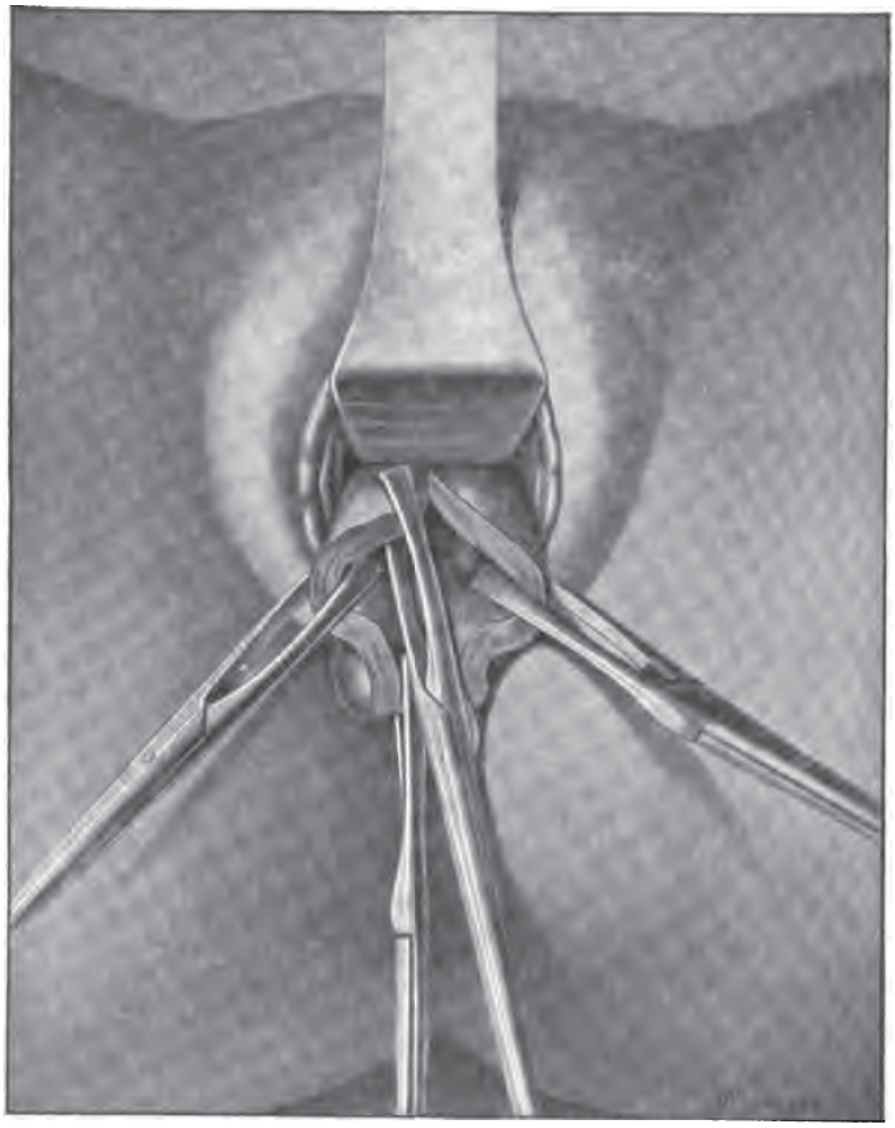

FIG. 231.—Progressive ascension of the forceps as the hemisection proceeds.

We must now free the adnexa. Commence with those on the left side. The index-finger and medius of the left hand are introduced above the fundus of the uterus and are directed toward the posterior aspect of the broad ligament and then they commence

to slowly detach the adherent adnexa. This freeing, which is easy in some cases, may be very difficult, even impossible. We will have to return to this point and the line of action to take in these cases when we study the application of vaginal hysterectomy with reference to the adnexa, and we will not dwell for the moment

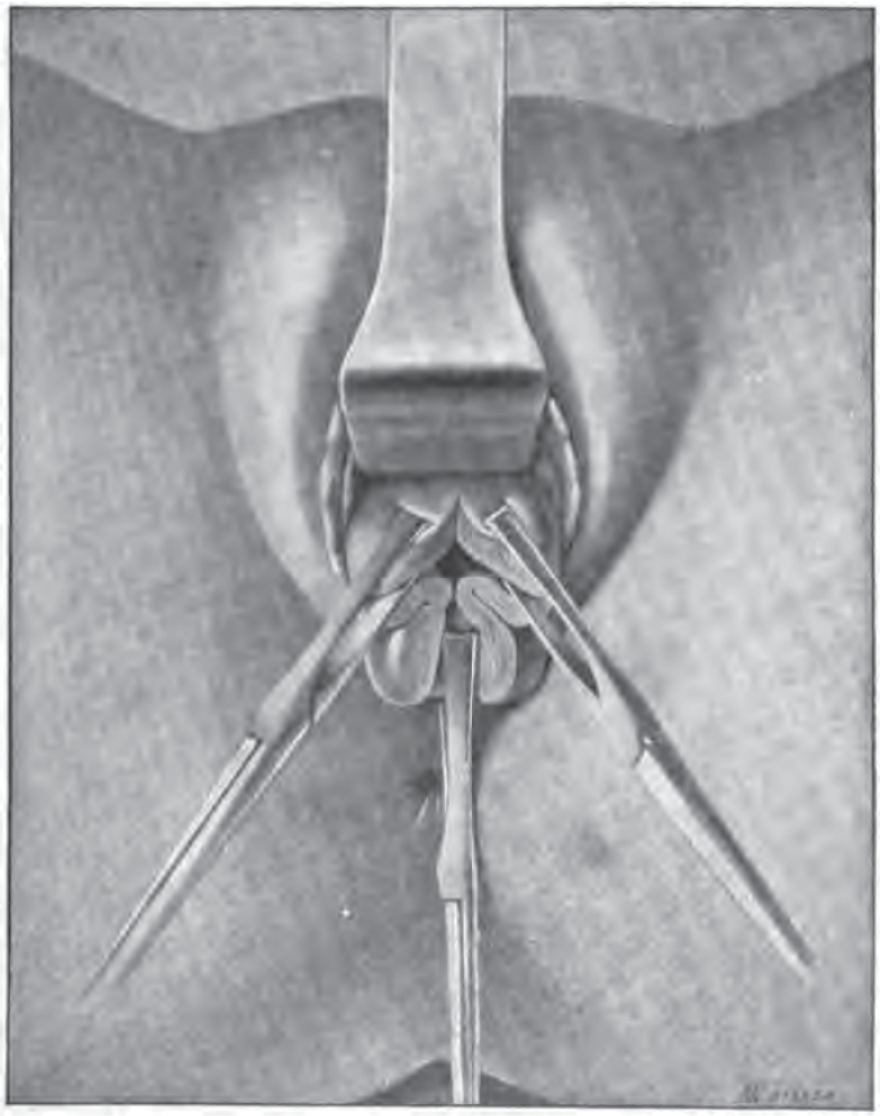

FIG. 232.—The incision has reached the fundus of the organ. The body of the uterus is tilted forward.

on this separation. Having freed the adnexa, these are directed toward the uterus and hemostasis of the broad ligament is carried out. In order to do this, charge the assistant to the right with the care of the uterus, and request him to gently draw it to his side. Then place the clamps in position under the double control of

eye and finger. In no case place forceps on a broad ligament unless under control of the eye. A short and strong pair of artery forceps, the model of which we have indicated, is attached from below up, external to the cervix; it is made to seize the interior half of the broad ligament where the uterine pedicle is situated.

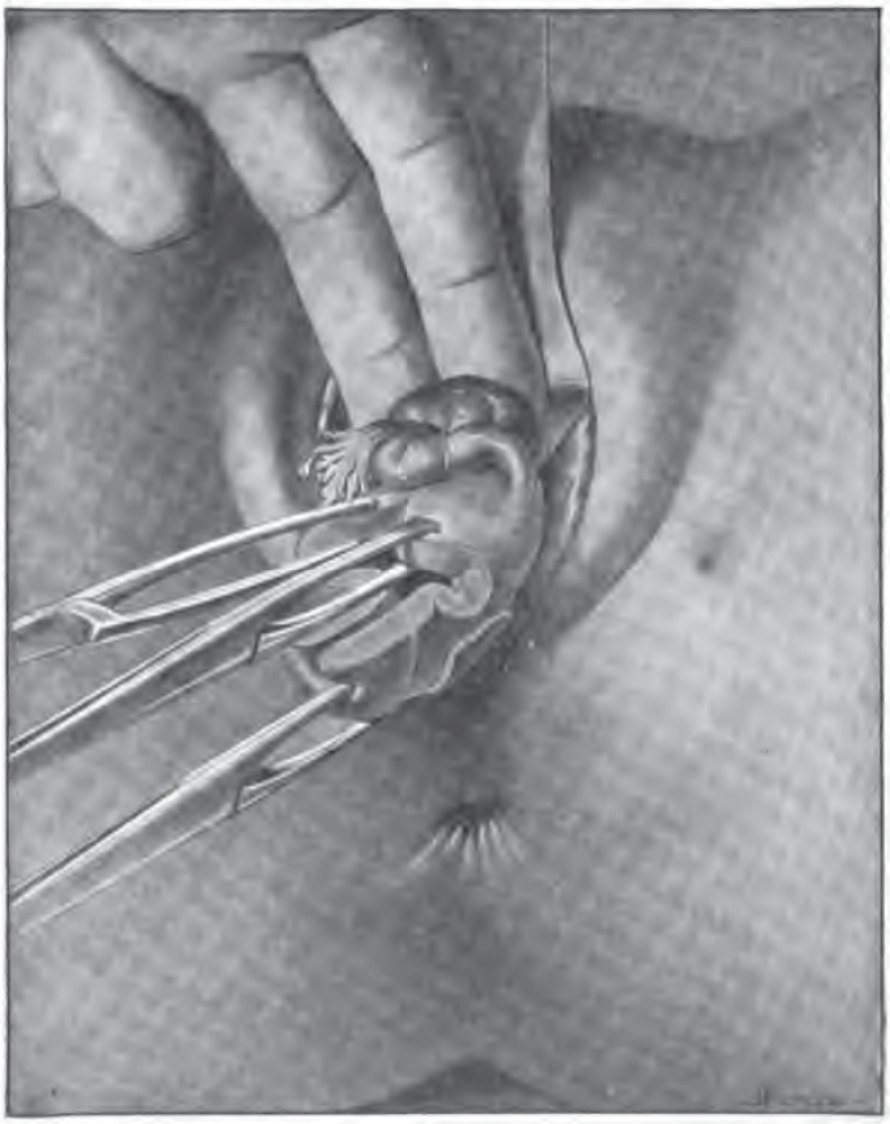

FIG. 233.—Freeing of left adnexa.

At the same time the two fingers of the left hand, introduced into the recto-uterine cul-de-sac, keep away the intestinal loops. A similar pair of forceps is attached in the inverse sense, that is, from above downward, to the upper part of the broad ligament, external to the adnexa and securing the superior pedicle. The

two forceps should be so placed that between them no part of the broad ligament should be exempt from pressure (Fig. 234). With scissors we cut through the broad ligament about 1 cm. external to the clamps.

Then we go on to the freeing of the right adnexa. Having

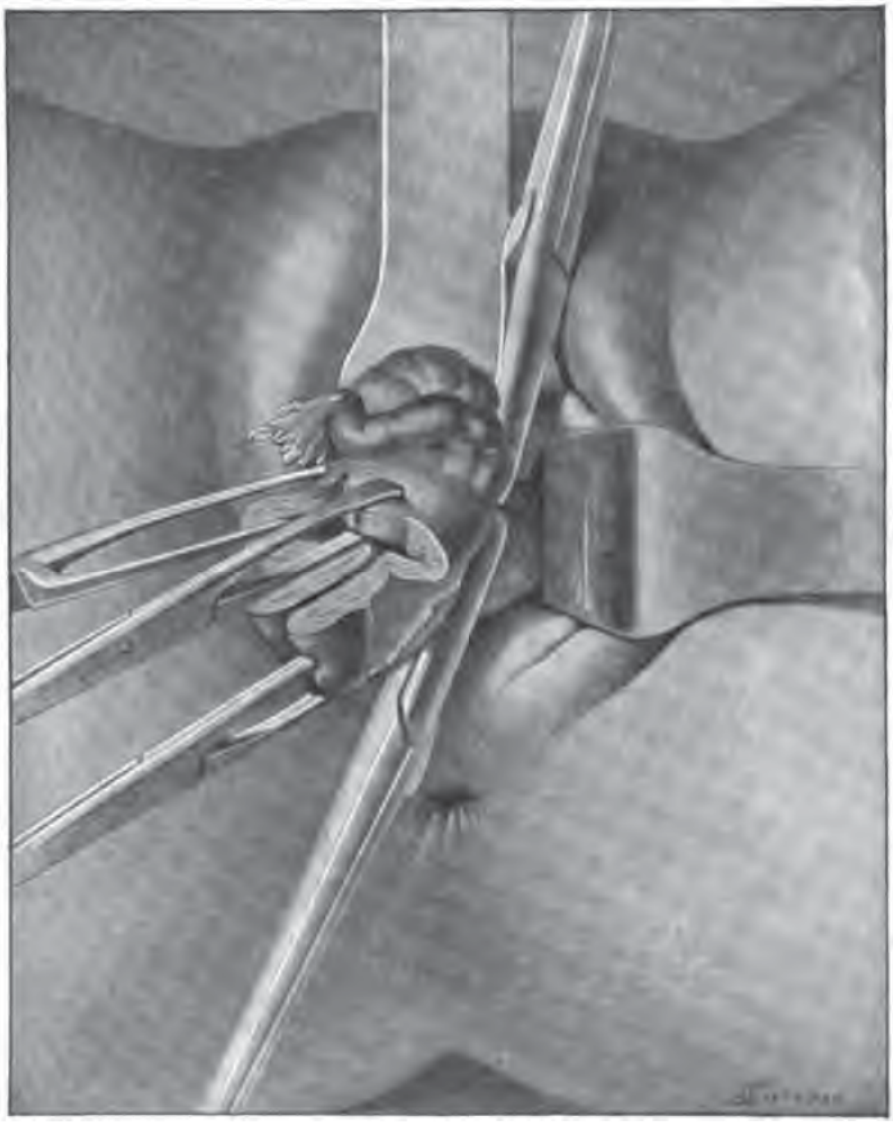

FIG. 234.—Forceps placed on the left broad ligament.

done this, the termination of the operation is very simple. The uterus which is only attached by the broad ligament of the right side should be guided to the vulva and, as on the left side, two pairs of forceps should be placed, one from below up and the

other from above down (Fig. 235). A cut of the scissors internal to these forceps enables us to make the final separation.

The two upper forceps, placed on the utero-ovarian pedicle, fall in front of the two forceps placed on the uterine pedicle; in this movement they drag with them the upper portion of the broad

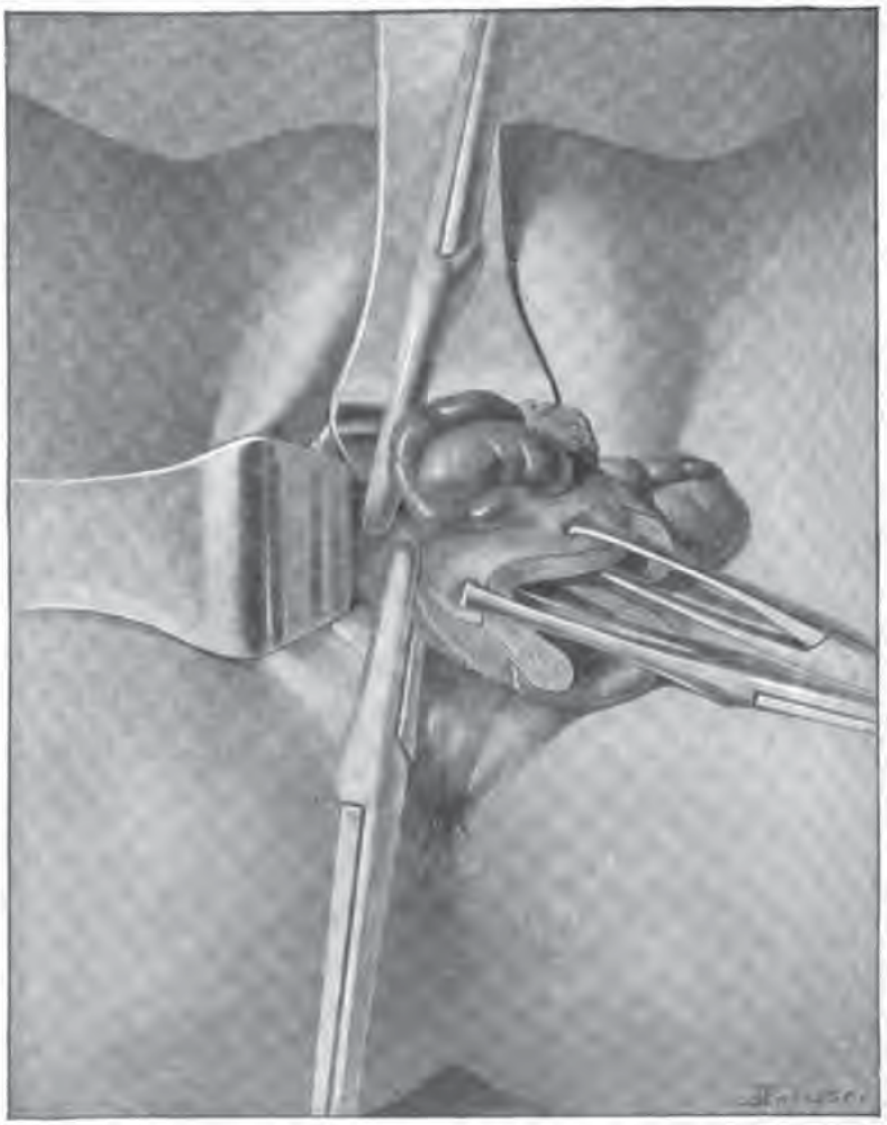

Fig. 235.—Forceps on the right broad ligament.

ligaments and bring about a folding of these ligaments which assumes the form of a dihedral angle, open below, and of which the summit corresponds to the junction of the upper and lower forceps.

If the operation has gone along smoothly and typically, these four forceps are quite sufficient to secure hemostasis.

It is, however, not always thus. In any case, before regarding the operation as terminated and doing the dressing, it is necessary to make a serious examination of the parts. To do so, separate one from the other two groups of forceps, which are doing duty as lateral retractors. Place anteriorly and posteriorly two long and narrow specula and with a tampon of gauze held in a pair of forceps, proceed to the toilet of the parts. One is thus able to see if any oozing is going on. If oozing exists, we must find the bleeding point and arrest it. If we are quite sure that the hold of the four chief forceps is perfect, the bleeding may have many origins. It may come from tears produced during separation of the adnexa; these tears are usually on the posterior aspect of the broad ligaments. It may come from the summit of the dihedral angle formed by the folding of the broad ligament; in these cases the blood comes from the arteriole of the round ligament which has escaped the forcipressure of the upper clamp. Finally, the vaginal incision may be the source of the hemorrhage. In any case, if the source of the hemorrhage has been discovered, it is easy to apply forcipressure to the bleeding vessel. Then we again turn our attention to the bleeding, and if hemostasis is absolute, we go on to the dressing.

This is done with several precautions with the aid of a long pair of vaginal dressing forceps. Two long strips of iodoform gauze are introduced. These gauze wicks should not go beyond the end of the clamps in such a manner as to prevent the contact of these latter with the intestines and finally to separate as widely as possible the intestine from the ligamentous stumps. The exterior extremity of the gauze is folded up in the vagina. A new gauze is interposed between the forceps and the fourchette in order to prevent the direct pressure of forceps on the mucous membrane and to thus avoid the production of little excoriations at this point. These are always painful and present a source of infection. The patient's bladder is catheterized, the vulva very carefully cleaned, and then covered over with a large layer of hydrophile wool, in the center of which is an opening to allow passage for the vaginal forceps. A T-shaped bandage completes it all; finally, be careful to unite the handles of the forceps with a piece of gauze loosely tied.

Postoperative Details.—The patient is kept quietly in bed in order to avoid any movement which may affect the forceps. Raise the patient slightly so that the forceps do not repose on the bed. The two thighs of the patient, united with a broad serviette, are maintained in flexion by a pillow placed under the popliteal spaces.

The *immediate postoperative treatment* is nothing special. It is that of any operation in which the peritoneal cavity is opened. Abstinence from food until evening: then alcoholic fluid (champagne or grog), taken in small quantities at regular intervals. As early as the day following, give liquid alimentation if no inflammatory complication occurs.

The patient's bladder should be catheterized. This should be done at intervals and is of much greater benefit than to leave it in continually, a course we must deprecate. A nurse should remain by the bed, watch the patient's movements and keep her on her back.

Certain surgeons apply an ice-bag continually to the abdomen in order to lessen the pain.

The forceps are taken off forty-eight hours after the operation. This is done very simply. Each clamp is carefully unclamped; then a slight movement of rotation is given to it in order to detach the blades from the tissues with which they were in contact. This being done, the clamp is gently drawn out, without jerks, and above all without force. If in spite of these precautions, one finds difficulty in removing the forceps, do not insist. Unclamp and take away the neighboring ones; that suffices often to render easily removed the recalcitrant pair. Afterward, after removal of the forceps, proceed to a rapid cleaning of the vulva and once more re-apply a layer of sterilized wool.

The gauze wicks are removed on the fourth or fifth day. To remove them, the patient is taken to the operating theater. This permits of washing the vulva with more care and enables the vagina to be thoroughly cleansed before the insertion of new gauze dressing, which will be purely vaginal now.

Commence vaginal injections on the eighth or tenth day. The cannula should be hardly made to enter the vagina, the vulva is maintained open and the pressure reduced to a minimum. The patient may get up on the fifteenth day.

Operative Difficulties.—The vaginal hysterectomy may be very difficult by reason of the tightness of vulva and vagina, by fixation of the uterus, by its friability and adhesions round about.

When the narrowness of vulva and vagina is not too considerable, simple dilatation with specula at the commencement of the operation suffices to give them sufficient dimensions. But if the stricture of the parts, congenital or acquired, presents a very marked degree, it is necessary to change the constricted nature of these tissues before thinking of a vaginal hysterectomy. The different varieties of vaginal incision and separation, which we have had occasion to describe, appear to us to be indicated only exceptionally. It may be sufficient to use repeated tamponing of the vagina or to dilate it with Gariel's pessary. We should not hesitate to employ these means; it is better, however, in these cases to use the abdominal route.

The uterus is usually fixed by peri-uterine inflammatory lesions. It constitutes an operative complication of the most annoying description and renders the drawing down of the uterus so difficult that one has to have recourse to morcellement of the organ.

The difficulties are maximum when to this fixation of the uterus is added friability of tissues. It is then quite impossible to attach a pair of traction forceps without tearing out a piece of the tissue. This friability occurs in hysterectomies soon after a pregnancy or abortion; it may also be seen, apart from pregnancies, in cancer of the uterus and in some special forms of parenchymatous metritis. We must then, according to J. L. Faure, replace traction forceps by forceps with a broad blade, such as are used in ovarian cysts. The large hold prevents the cervix from being torn.

We will not insist on the difficulties due to adhesions of the adnexa, as we will return to this point when we study vaginal hysterectomy in case of salpingo-ovaritis.

In a general way, with patience and method, we can triumph over these difficulties. If, however, they are too considerable, do not continue too long on an operation which is so difficult, but abandon it for the abdominal route.

Complications.—We may come across, during or after a hysterectomy, a certain number of complications which it would be well to go into.

Hemorrhages.—The most important complication is hemorrhage. It may come on during the performance of vaginal hysterectomy and results generally from some operative error. If one takes care to proceed in a methodical manner, clamping the ligaments before cutting them, and to proceed always under direct control of the eye, there is every chance of avoiding hemorrhage during the operation.

If the hemorrhage comes on some little time after the operation, it is due generally to breaking or slackening of the hold of one of the clamps which assures the hemostasis of the broad ligaments. It comes on usually when one uses long-bladed forceps, and when one has applied only a single forceps on each broad ligament. In the procedure we have advised, by using two shorter-bladed forceps, all such accidents may be in that manner avoided.

In presence of a hemorrhage due to this cause, seize the point that bleeds through the vagina. *But most important to remember, do not work in the dark.* The patient should be anesthetized, if necessary, and conveyed to the theater. The specula expose the operative field. Do not forget that these attempts to secure secondary hemostasis have often wounded the ureter; for this reason do not pinch up a part with the forceps until one is quite sure of all freedom from danger. Prepare as for an abdominal celiotomy. If the attempts to arrest hemorrhage by the vaginal route remain fruitless, do not hesitate but search for the bleeding point by operating through the abdomen.

The hemorrhages which succeed the removal of the forceps are justifiable of a similar line of action. It has been recommended that, in order to avoid this complication, one should unclamp the forceps, and leave them in position for about an hour afterward. If hemorrhage recurs, nothing is easier than to reclamp.

This procedure is little practised and it is dangerous also. A loop of intestine may come between the separated blades and be imprisoned at the moment of reclamping. Like all these blind manipulations, they should be avoided.

The hemorrhages which come on about the thirteenth or fourteenth day come from infection as in all secondary hemorrhages. They should be treated with tampons of iodoform gauze.

Lesion of Neighboring Organs.—A certain number of organs may be injured during the operation.

Wound of the ureter is rare in the hands of an experienced surgeon. In 450 vaginal hysterectomies, Segond only had two cases. In the great majority of cases it is the right ureter which is injured and the reason will be seen later.

The ureter may be wounded in the incision of the cervix. This particular section of the ureter is exceptional and it is easy to avoid by incising the vagina on the cervix itself, and at a little distance from the external os.

Much more frequently the ureter is wounded during forcipressure on the interior portion of the broad ligaments. This inclusion of the ureter has two reasons: first, an insufficient liberation of the anterior face of the uterus and broad ligament; second, to a too oblique attachment of the clamp.

It is shown that when the uterus is drawn down toward the vulva, it tends to become enclosed between the two ureters, and that these, normally separated from the cervix for a distance of 12 to 15 mm. come to lie in contact with the uterus at the level of the isthmus. The freeing of the anterior surface of the uterus and of the broad ligaments corrects somewhat this displacement and throws the ureter outward. The lateral incisions, added by Segond to the circular incision which circumscribes the cervix, facilitate greatly this pressing back of the ureter, in permitting the separation of the uretero-vesical and utero-vaginal planes laterally.

If one thinks of the inconvenience of placing clamps in the oblique position, it is enough to make one avoid this operative mistake. If one represents the position of the hands of the operator at the moment of clamping the right broad ligament, it is easy to grasp why one is more exposed to commit the mistake on the right side. This explanation also suffices to explain the great frequency of lesions of the ureter on this side.

Still we do not think it right to blame such and such an operative procedure, and the reproaches directed to the operation by "bascule," or inversion of the uterus without preliminary

amputation of the cervix, such as Doyen does, do not appear to be founded.

Finally, the urethra is above all exposed to be pinched up in the course of atypical manipulations, resulting from an abnormal anatomical disposition of parts or an unforeseen operative complication. In one case it may be due to the commencement of an invasion of the broad ligament by a neoplasm which obliges one to place the clamps laterally; in another case, it is a hemorrhage due to improper application of a pair of forceps or to the slipping off of forceps, which leads us to add a supplementary pair. For these abnormal circumstances, it is impossible to give precise rules of action. It is well to recall that in these atypical cases it is particularly the case to avoid proceeding in a blind manner, and not under control of the eye.

If the ureter is cut across, the urine commences to run into the vagina some hours after the operation. But, as most often the ureter is injured by being pinched up, the discharge is only produced when the scar tissue comes away, from the fifth to the eighth day. If it is a question of an inclusion laterally, renal pains more or less severe may cause a suspicion; if from the beginning of this operative complication, it is, however, not constant.

We will have occasion to return to the treatment of these uretero-vaginal fistulas, following on hysterectomy.

Wounds to the Bladder.—Wound of the bladder is more frequent. Segond observed this five times in 200 cases. The bladder is wounded sometimes at the moment of incision of the anterior fornix or maybe at the moment of liberation of the subperitoneal portion of the anterior face of the uterus.

In contradistinction to utero-vaginal fistulas, the vesico-vaginal one may sometimes heal spontaneously.

Wounds of the Rectum.—The wounds of the rectum are far from rare (nine cases in 200 operations, after Segond). Often prepared by lesions of the rectal wall, they are often produced at the moment when one frees the posterior surface of the uterus. They may heal spontaneously; we have already considered the operative procedures for them.

Wounds of the Small Intestine.—The wounds of the small

intestine, much more exceptional (two cases in 200, Segond), are generally caused by the freeing of the very adherent adnexa and are only met in very complex cases.

Peritonitis.—Septic peritonitis is the most serious of all the complications which come on after vaginal hysterectomy. It is the habitual cause of death after that operation and one can say that the percentage of deaths after vaginal hysterectomy practically denotes the number of cases of peritonitis following on operation.

This complication has become rare and is becoming rarer. The relative benign character of vaginal hysterectomy from the point of view of infection may cause astonishment when one thinks how difficult it is, despite the precautions one takes to artificially unite the operative field from the side of the abdominal cavity. This fact explains precisely that in grave cases where suppurative lesions exist, the pelvic cavity is isolated by adhesions from the large peritoneal cavity; it is explained also by the large open drainage route of the vagina. As we will have occasion to see further, in studying the septic peritonitis following on celiotomy we are almost disarmed, surgically speaking, in the presence of this complication.

Intestinal Occlusion.—This usually results from an adhesion of the intestine at the vaginal cicatrix and appears at a variable epoch after the operation. One may in these cases of precocious occlusion liberate the intestine by manipulations through the vagina. This is most often accomplished by the establishment of an artificial anus, or by a colotomy followed by freeing of the adhesions. We have seen after a simple fistulation of the intestine, all the occlusion troubles disappear and the fistula close spontaneously afterward. The method of action appears to be indicated in certain cases, where the general condition contraindicates a more serious intervention.

Eschars.—Sometimes these appear as sacral eschars in women having undergone a vaginal hysterectomy. These are said to be lesions of the trophic order. We think these bedsores are only macerations of the skin, and since that we have lost fear of moving the patients in order to secure for them the necessary attention and cleanliness this complication has completely disappeared from our wards. With appropriate dressings, these eschars heal rapidly.

2. Various Procedures.

Doyen's Procedure.—We will not insist on the procedure of Doyen. As may be seen, it rests on two fundamental principles: *rejection of all preventive hemostases; median anterior hemisection in order to permit the uterus to be tilted forward.*[1]

We will confine ourselves to remarking that Doyen brings about the hemostasis of the broad ligament with a single pair of very long elastic forceps which he applies from above downward along the extent of the broad ligament. Generally he places a second reinforcing forceps internal to the first part. We prefer the technic we described previously in this book. In cases where the adnexa are difficult to get at it will be well sometimes to continue anterior median hemisection on the posterior face as far as the cervix. Each half of the uterus attached to its broad ligament is more easily drawn out.

Pean's Procedure.—Preventive forcipressure and morcellement are the two principles of Pean. This procedure is done in the following manner: A circular incision disinserts the vagina. Then free by separation the two faces of the uterus and broad ligaments up to a certain height, more or less extensive. Apply forceps to the liberated portion of the ligaments which are cut through internal to the forceps. The fragment of uterus liberated by this partial section of the broad ligaments is then divided with strong scissors into two portions, one anterior and the other posterior. One forceps is placed at the base of each portion and the segment of the uterus placed below the forceps is excised. The same procedure is repeated on the portion of the uterus that lies above. Each stage may thus be divided into four principal parts: 1. The freeing of the anterior surface of the uterus from the posterior. 2. The clamping and section of the broad ligaments. 3. The division into two portions of the portion of the uterus freed by the preceding manipulations. 4. The excision of the two portions thus obtained. We thus obtain, by successive stages, the complete excision of the uterus.

The most important point is never to cut through a segment of the uterus before placing above it another traction forceps in

[1] Döderlein advised a median posterior hemisection of the uterus. (*Arch. f. Gyn.*, 1901, T. LXIII, p. 1.)

order to preserve always a solid hold, without which the fundus of the uterus may sharply disappear into the depths and from whence it could only be recovered with great difficulty.

We must never go away from the median line in the holds we take in order to avoid false holds, tears, hemorrhage and wounds of neighboring organs.

Segond's Operation.—It may be summed up as follows *Segond commences the hysterectomy like Pean and finishes like Doyen.* He commences really by excising the cervix; to do this he clamps and cuts through the lower portion of the broad ligament, isolated at first on each side of the cervix from the peri-

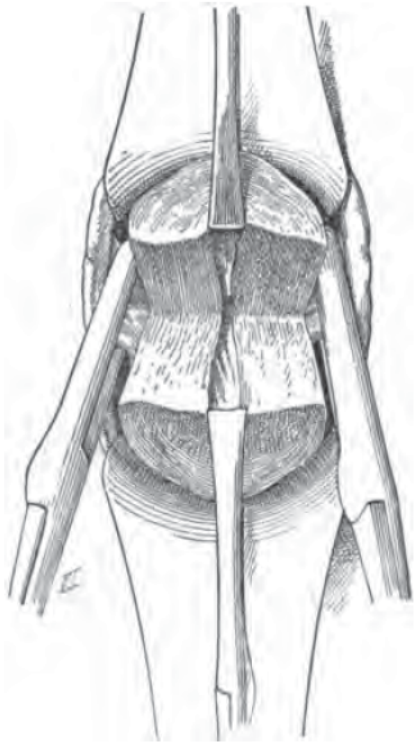

FIG. 236.—Morcellement of the uterus (J. L. Faure).

uterine tissues (interior portion of the broad ligament with the uterine artery, interior portion of the utero-sacral ligament of the same side). A short-bladed forceps seizes the tissues on each side of the cervix and a single cut of the scissors divides them between the forceps and the cervix. As the descent of the uterus is often limited by the utero-sacral ligaments, when these are sectioned across, the uterus descends some centimeters and the operation is facilitated.

The cervix is divided into two portions, one anterior and one

posterior, which are successively excised. This being done, the body of the uterus is extracted by making its fundus descend by virtue of a conoid-shaped scooping out of the anterior wall or simply thanks to a median hemisection of that wall. Segond attaches great importance to the preliminary amputation of the cervix which would constitute, according to him, the best means of putting out of count the possible injury of the ureters.

Procedures of Quenu and Muller.—While these two surgeons have one identical manipulation, *the total median sectioning across of the uterus*, otherwise the procedures of Quenu and Muller cannot be compared.

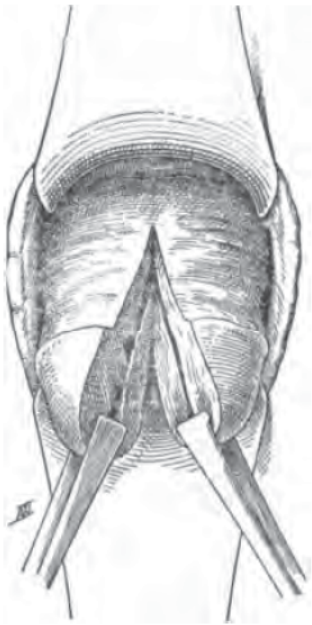

FIG. 237.—Total median hemisection; two forceps draw down and out the two halves of the cervix.

In Muller's procedure, the hemisection is done at the end of the operation if the uterus, which has been liberated, has descended. It is a complementary maneuver, destined to facilitate the ligature of the two broad ligaments. It is based on the observation that ligature of the second broad ligament is always much easier than that of the first.

In Quenu's procedure the hemisection is to enable the organ to be more easily drawn down. This maneuver is carried out at the beginning of the operation as it is done in Doyen's anterior hemisection. The uterus, drawn upon by forceps, does not so much tend to flex forward as in the median anterior section, but

to open itself out, to sink upon itself, so to speak, in the median line, in descending in the axis of the pelvis (Fig. 237). The more the two segments separate in divergence, and the more the fundus descends, the more does one continue the median section toward the fundus (Fig. 238) and eventually by fresh holds and successive sections of the uterus to completely divide it into two. The rest

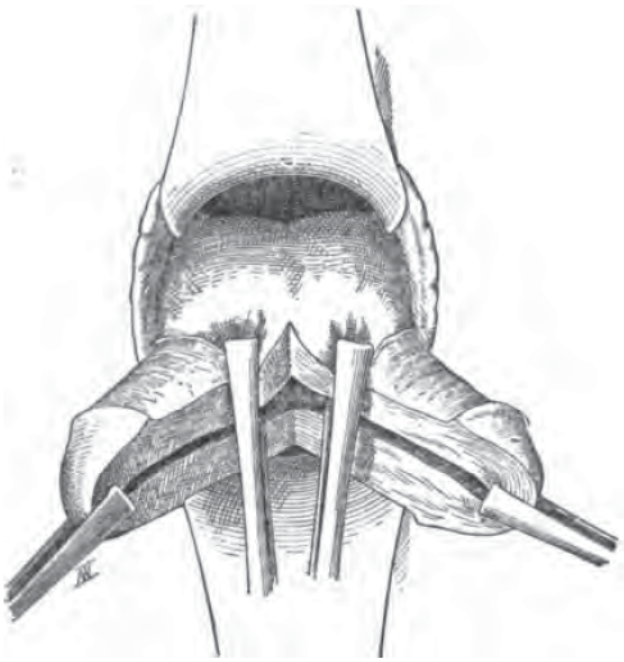

FIG. 238.—While the hemisection advances and the two halves of the uterus separate the fundus descends and comes down to the vulva.

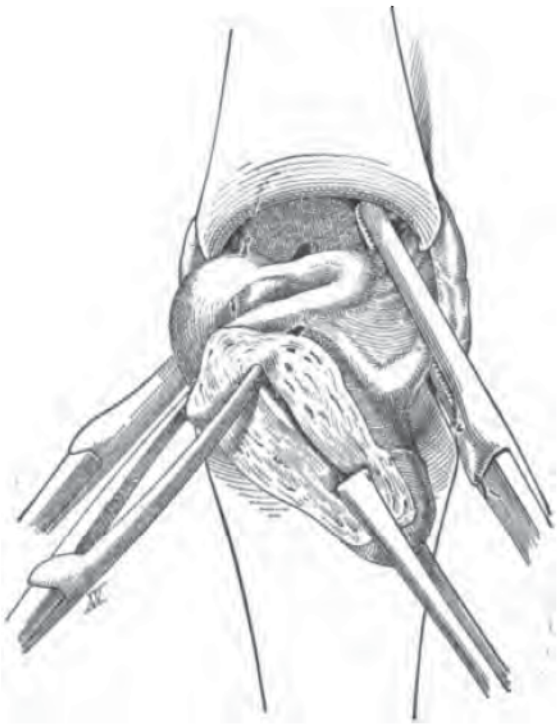

FIG. 239.—One of the halves of the uterus has been pushed back into the pelvis and this permits of the more easy descent of the other.

of the operation with relation to each half is continued as in the procedure of Doyen, the section of the uterus has been carried out through the cervix, posterior wall and cervix. It is at times of advantage when the median section is finished to press back one of the halves into the pelvis and thus render the drawing down of the other easier.

J. L. Faure's Procedure.—If the uterus does not come down, even after total hemisection, the fundus of the uterus remains immobile in the pelvis; then we may sometimes get at the uterine cornua in resorting to Pean's morcellement, and in practising *transverse segmentation of the uterus.* After the median section of a part of the uterus, if one does not gain any more ground, one

should cut across one of the halves of the uterus. The segment, constituted by the segment thus cut across, separates and with a forceps introduced from above upward along the length of the uterine border one is able to seize the upper portion of the broad ligament up to the cornu of the uterus. With a pair of scissors detach this uterine cornu from its insertion into the broad ligament, and the mobilization of the uterus enables us to conclude an operation which appeared at first to possess insurmountable obstacles.

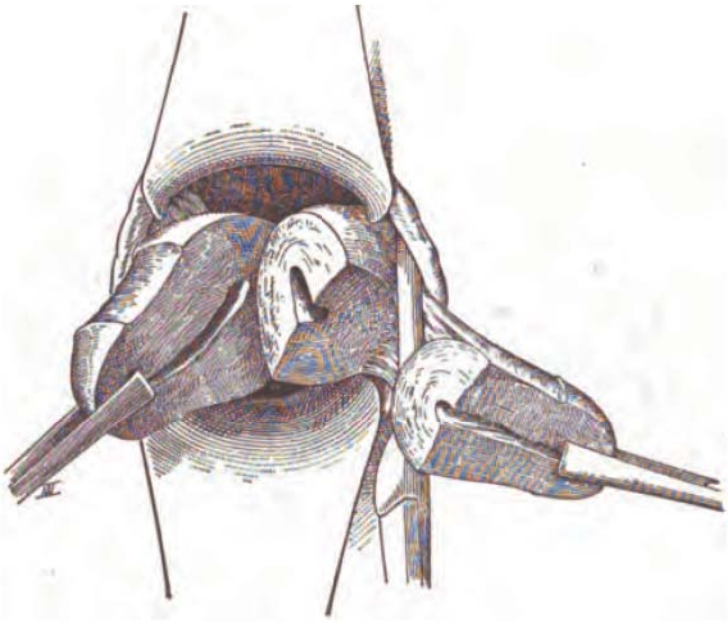

FIG. 240.—Transverse version of the uterus after hemisection.

Ligature of the Broad Ligaments. Angiotripsy. Galvanocautery.—All the procedures we have described have in common the hemostasis of the broad ligaments by means of a forcipressure, which is allowed to persist during a certain period of time. The ligature of the broad ligaments is generally rejected save in certain exceptional cases (hysterectomy for prolapse).

Even in Germany, where for a long time fervent operators opposed it, they have now accepted forcipressure. It is not without drawbacks and the clamps left in for forty-eight hours interfere considerably with the comfort of the patients. This has inspired certain surgeons (Doyen, Tuffier in France, Thumin, Amann in Germany) with the notion of applying *angiotripsy* to vaginal hysterectomy. Although this has been successful, it

is not without danger; there has been persistent oozing, in fact veritable hemorrhages or even peritoneal infection by the falling back into the abdomen of the pedicles which are no longer held in the vaginal wound by ligatures or clamps. It is generally admitted that it is imprudent to apply it without adding "ligatures of safety" and without closing up the peritoneum above the stumps (Doyen). We are precipitated thus into the position of the inconvenience of ligatures and operative complications. Also, in spite of the enthusiasm excited at first, angiotripsy is hardly ever employed as a means of hemostasis in vaginal hysterectomy.

The employment of the *galvano-cautery* advocated formerly by Byrne for amputation of the cervix, has been recently put forward by Werder for hysterectomy in cancer; one avoids, by these means, all local recurrences. The vaginal mucous membrane is incised around the cervix with a galvano-cautery at a dull red heat; the fornices are opened; the uterus is tilted forward; and downward clamps are placed on the broad ligaments which are afterward cut across. The uterus being lifted out, the broad ligaments are drawn on and then external to the forceps, Downes' electro-thermic clamps are applied. These crush the tissues like an angiotribe and then cauterize the crushed parts.[1] All the bleeding points of the wound are cauterized and recauterized. Conclude the operation by suturing the retro-vesical peritoneum to the posterior peritoneum of the pouch of Douglas, leaving on each side a space, in order to insinuate along the stump of the broad ligament a dressing of iodoform gauze, which is taken out at the end of four or five days.

3. Operative Modifications According to the Nature of the Lesion.

1. Vaginal Hysterectomy in Cancer.—Vaginal hysterectomy may be done either for cancers of the cavity of the uterus or for cancers of the cervix. In the latter case, it is better to do a preliminary radical curettage, removing all the cancerous vegetations. The curettage should be done immediately before the hysterectomy, may be several days before, when clinical symptoms lead one to

[1] Cauterization is obtained by the action of a band of platinum which is doubled over one of the blades of the forceps and kept red with an electric current. (Downes, *Ann. de Gynec.*, 1903, T. I, p. 355.)

think that there exists a serious degree of infection of the cancerous vegetations. The preliminary curettage has a double advantage: it permits us, first, to secure a possible disinfection of the operative field to a degree unknown of any antiseptic solutions. It has the advantage of facilitating the clinical exploration and of enabling us to appreciate with more precision than by the bimanual examination the degree of extension of the neoplasm and of seeing if a radical operation is or is not indicated.

Vaginal hysterectomy for cancer would not have the pretension of being a radical operation if it only attacked the primary focus, without being concerned with the lymphatic vessels which are more frequently invaded.

It should be conducted in such a manner as to excise the entire primitive focus and to avoid the grafting of the neoplasm on the raw surfaces. This double desideratum dominates the operative technic in cases of vaginal hysterectomy for cancer.

If it is a question of a cavity cancer, circumscribe the cervix with the ordinary incision. If it is a case of cancer of the cervix, average case, commence by the dissection up of a little vaginal collar, which is prudently detached anteriorly from the bladder and posteriorly from the rectum. Commence the operation by freeing the bladder, because the invasion of this organ should be regarded as an operative contraindication. In order to find out the state of the bladder, commence by a lateral in front of the broad ligaments. Move the hand gently toward the median line; if at this level one finds friable tissue, stop. To pursue the operation would lead to the formation of a vesico-vaginal, in the absence of which one might hope for a relatively durable result.

If the bladder is recognized as healthy, proceed with operation in opening the recto-uterine cul-de-sac and conclude by anterior hemisection procedure, following out the technic we have already indicated. In these particular cases of cancer of the cervix, Segond's procedure has the advantage of removing from the operative field the cancerous mass which may infect the tissues and graft cancer anew.

It is generally conceded that the removal of the adnexa should be carried out because cases have been reported of metastatic deposits in the ovaries.

The immediate results are the following:

In 2156 cases collected by Richot there were 175 deaths or 8 to 10 per cent.

The operation does not therefore present an extreme gravity. Unhappily the later results are more mediocre. In F. Ferrier's work the recurrences have been 70 per cent.; according to Zweifel, 65 per cent., and Olshausen, 61 per cent.

The recurrence is above all in the first year that follows the operation; the frequency diminishes gradually as the interval lengthens, as the following table of recurrences compiled by Segond shows:

The recurrence occurred 14 times in the first year.
The recurrence occurred 9 times in the second year.
The recurrence occurred 5 times in the third year.
The recurrence occurred 0 times in the fourth year.
The recurrence occurred 1 time in the fifth year.

After five years the cure may be regarded as certain. But Segond observed one recurrence after seven years.

The recurrences are almost always seen in the vaginal wall, near the scar in the cicatrix itself or a little above it, probably due to the implanting of cancerous grafts during excision. These local recurrences induced Werder to resort to excision by galvano-cautery.

2. **Vaginal Hysterectomy in Fibromata.**—This is often done for fibromata. We will see that it loses ground more and more and tends to be replaced in the majority of cases by abdominal hysterectomy.

One point dominates all the technic of vaginal hysterectomy for fibromata: it is the great importance of, one might almost say imperative nature of, morcellement.

This morcellement has a double end in view: To diminish the volume of the tumor and to permit it to pass through the vaginal tissues and reduce the uterus to a flexible shell, so to speak, which will tilt forward as in the way a uterus of normal dimensions does after a simple anterior hemisection.

It is evident that the manipulations which give this double result may vary according to each case. Some smaller fibromata, easily accessible, may be torn out with the first pressure

applied to the traction forceps, which seizes them and draws upon them at the same time imparting to them a twist. If the fibromata are larger, more solidly attached, then we would resort to morcellement with the bistoury or scissors, aiding ourselves as required by the corkscrew and evacuating conoid-shaped masses of tissue. If the fibromata are situated high up and inaccessible, we commence by excising a V-shaped area of uterine tissue. (See before, morcellement in vaginal myomectomy.)

The uterus is attacked on its anterior surface. The anterior wall is resected over a more or less extended area; this resection admits of successive enucleation of different fibromatous masses with or without morcellement.

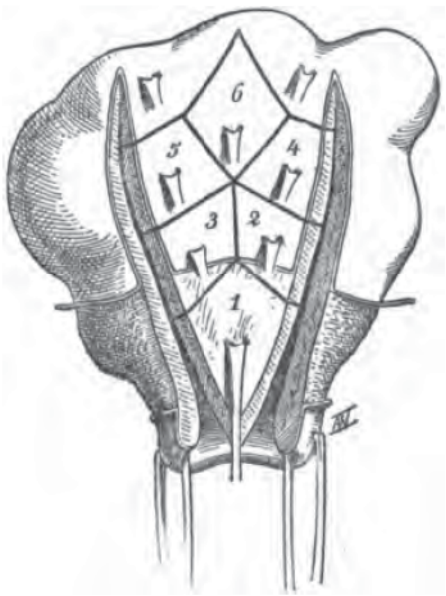

FIG. 241.—Morcellement of the anterior face of the uterus (Doyen). The segments 1, 2, 3, etc., are successively excised.

The general shape of the resected area is a V with the summit below (Fig. 241).

In these manipulations there is never need to excise a fragment of the mass without having as preliminary placed a traction forceps on the part immediately above.

In a general way the commencement of the operation is difficult; beginning by removing very small pieces, one proceeds to greater and greater. At length we have a uterus emptied of all the fibromata it contained and of which the anterior wall has in a great measure disappeared. Nothing is simpler than to

lever up the uterus and then apply forcipressure to the broad ligaments as usual.

This method of procedure appears to be superior to that in which the fibromatous uterus is resected by successive stages, with forcipressure and preliminary section of the corresponding portion of the broad ligaments, as in Pean's operation.

In 1369 vaginal hysterectomies for fibroma, Richelot had 63 deaths, giving 4.6 per cent.

Segond, whose experience and skill in vaginal surgery is so well known, gives results of 15 per cent. of deaths in vaginal hysterectomy for fibroma.

These differences may be explained by the fact that Segond pushes to excess the vaginal operative route and thus in attempting very difficult cases acquires a higher mortality.

3. **Vaginal Hysterectomy in Inflammation of the Adnexa.**—It is known that Pean regarded the excision of the uterus as the essential stage in the treatment of inflammations of the adnexa by the vaginal route. We excise, to use his expression, "la bonde," the bung literally which closes the suppurating peri-uterine pockets; these being freely drained by the preliminary excision of the uterus, heal perfectly without any call for their individual extirpation. This is a mistake; we have on many occasions excised the entire uterus without opening any peri-uterine suppurative foci. For this reason, modern surgeons prefer to excise the diseased adnexa with the uterus.

It is certain that this excision is difficult and often even impossible. But systematic attempts at excision, even when they fail, have the advantage of preventing a suppurating focus, remaining unopened in spite of the excision of the uterus.

In excision of the adnexa during vaginal hysterectomy, free these by the hand. They are separated behind the posterior surface of the broad ligaments, and we then endeavor to draw them toward the fundus of the uterus. Surgeons with knowledge of the vaginal route generally succeed in the extirpation in the majority of cases (Segond, 55 times in 77 cases; Bouilly, 45 times in 52 cases; Jacobs, 372 times in 421 cases).

The immediate results of vaginal hysterectomy for diseased adnexa are the following: In 1113 cases collected by Bardenheuer,

he had 39 deaths, giving about 3.5 per cent. Particular statistics give an average mortality slightly higher.

Richelot, 307 operations, 15 deaths; 4.87 per cent.
Segond, 200 operations, 14 deaths; 7 per cent.
Reynier, 52 operations, 6 deaths; 11 per cent.
Bouilly, 51 operations, 3 deaths; 5.8 per cent.

4. **Hysterectomy in Puerperal Infection.**—The puerperal uterus is very friable; its cervix tears under traction of toothed forceps, which are usually employed for the drawing down of

FIG. 242.—Puerperal hysterectomy. The friable uterus is seized with cyst forceps (J. L. Faure).

the uterus. After successive holds the cervix is lacerated, becomes unrecognizable and unfit as a hold in order to do the operation. All these inconveniences disappear if, as J. L. Faure advises, one uses broad-bladed cyst forceps instead of the toothed variety. The large hold prevents the cervix from tearing. In women recently "accouchees" with a large vagina and a supple uterus the operation is of the easiest if one draws gently on the uterus without force. The uterus flexes forward with the greatest facility and the operation is terminated very rapidly.

5. **Vaginal Hysterectomy for Prolapse.**—Vaginal hysterec-

tomy is rarely practised for prolapse; it is only exceptionally indicated in the treatment of this affection.

The technic of hysterectomy in these cases presents some peculiarities by reason of the special anatomical conditions we find.

1. The replacing of continuous forcipressure by ligatures, the broad ligaments being, as the result of the drawing out of the uterus, very accessible.

2. The necessity of making at the same time as an excision of the uterus a large excision of the vagina, since this canal undergoes a considerable increase in size as the result of the prolapse.

FIG. 243.—The posterior denudation traced (Asch).

Fritsch's Procedure.—To do this operation draw strongly on the cervix upward and forward. A V-shaped incision is then made with the summit pointing posteriorly at the level of junction of the posterior third with the anterior two-thirds of the posterior vaginal wall (Fig. 243). The pouch of Douglas is opened and the peritoneum is sutured to the posterior lip of the incision. It is then easy to draw the fundus of the uterus into the wound. The broad ligaments are tied off in stages commencing from above, and removing if possible the adnexa. It only remains to separate off the bladder and to resect the anterior vaginal wall.

The cervix is now strongly drawn downward, and a U-shaped incision is made in the vagina with the convexity corresponding to the ureter (Fig. 244), and the mucous membrane is separated up from this almost to the cervix. This is done partly with a scalpel and partly by the finger. This stage of the operation is difficult, especially when anterior colporrhaphies force us to work in cicatricial tissue.

Once the cervix is reached, we may operate from above downward by the vesico-uterine cul-de-sac. If the adhesion to

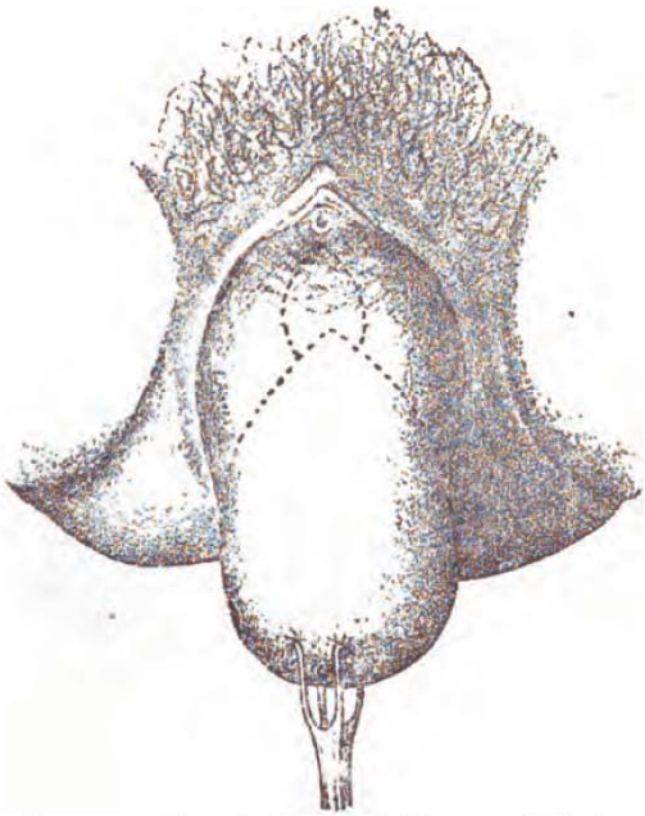

FIG. 244.—The anterior denudation traced (Asch).

the bladder is too firm separate off a thin layer of uterine tissue.

The uterus having been excised with the two large anterior and posterior flaps of vaginal mucous membrane attached to it, the two lips resulting from the resection of the mucous membrane of the anterior wall of the vagina are united transversely; then, after having reduced the bladder, it is covered over again with vesico-uterine peritoneum which is sutured to the mucous membrane of the vagina. Further, the pedicles of the broad

ligaments are sutured to the vagina on each side and thus keeping it in suspension.

The non-obliterated peritoneal cavity is tamponed with iodoform gauze. The operation is concluded with a reconstruction of the perineum.

Doyen's Procedure.—Acting on the observation that the pouch of Douglas is always easily accessible when the inferior border of the bladder is sometimes difficult to make out amidst the hypertrophied and indurated tissues that surround it, Doyen commences by opening the peritoneum posteriorly. He cuts across the mucous membrane transversely at the level of the old posterior fornix of the vagina. As soon as the lips of the mucous membrane open out, he makes in the median line pos-

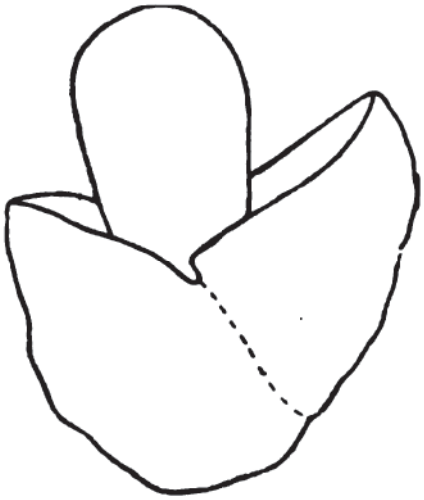

FIG. 245.—Totality of excised parts (Asch).

teriorly a longitudinal incision which opens the inferior portion of the pouch of Douglas. After enlarging the peritoneal opening with the fingers, he hooks up the fundus of the uterus and, making it tilt forward, he draws it outside.

A longitudinal hemisection carried out on the posterior aspect of the uterus is continued on to the fundus and then on to the anterior aspect. The uterus and bladder are separated with the finger or a blunt instrument and then after completing the hemisection the anterior fornix is opened. The circumference of the cervix is freed by the dissection of a collarette of the vagina. The two halves of the uterus are now only held by the broad ligaments.

After giving each of these halves a torsion of 180 degrees,

imparting to each broad ligament the appearance of a spiral cord, these cords are crushed, ligatured, and cut below the ligaments. Then he closes by a purse-string suture, which in passing through the broad ligaments, takes up the peritoneal collarette. He excises the largest part of the anterior wall of the vagina and does an anterior colporrhaphy and concludes with a colpo-perineorrhaphy.

Results.—Considering the weakness generally found among patients operated on for prolapse, the hysterectomy gives a fairly elevated mortality of five deaths in 57 cases we have collected,[1] which number is a little higher than that given personally by Kirchgessner, who in 40 cases had three deaths.[2]

The later results, if one is confined to the excision of the uterus and of the vagina, have been mediocre; it has also been found necessary to add drastic perineal operations to the excision of the uterus.

In these conditions it is understood that we reserve this operation to the cases where a lesion of the organ exists (gangrene, fibroma, cancer), which suffices in itself to render excision necessary, and to those cases where the uterus is constantly external, extensively ulcerated, and is the origin of various discharges, mucopurulent or sanguineous, and in women, either at or past the menopause.

6. **Vaginal Hysterectomy in Uterine Inversion.**—The operative technic differs according as whether inversion is incomplete or complete.

In incomplete inversion seize the cervix with two traction forceps attached at the level of the commissures. Circumscribe the cervix with a circular incision, penetrate the posterior cul-de-sac, then explore the pelvic cavity and determine the anatomical disposition of the uterus. Then pass to the liberation of the anterior part.

Split the cervix in the median line anteriorly. Then see if that incision is not sufficient to secure the reduction of the inversion of the uterus. If the reduction is impossible, continue the operation by opening the anterior cul-de-sac. Nothing is

[1] Hartmann and du Bouchet, Vaginal Hysterectomy in Treatment of Uterine Prolapse. *Annales de gyn.*, Paris, 1894, T. I, p. 45.

[2] Ph. Kirchgessner, Complete Vaginal Extirpation in Complete Uterine Prolapse. *Zeitschr. f. Geb. u. Gyn.*, Stuttgart, 1906, T. LVIII, p. 230.

simpler than tying or seizing the broad ligaments in a pair of forceps and of separating off the uterus.

If the inversion is complete, the commencement of the hysterectomy may be delicate. Do a circular incision at the level of the cervix, which may be determined by palpation.

Open the posterior fornix as soon as the peritoneum is opened, introduce the finger into the peritoneal cavity and draw it in front of the cervix. Then with the finger open the anterior fornix cautiously. When the uterus is freed anteriorly, the operation may be pursued without difficulty as in incomplete inversion.

7. **Vaginal Hysterectomy for Juxta-uterine Tumors.**—Vaginal hysterectomy may be done during the course of an operation for excision of a juxta-uterine tumor.[1]

Two cases present themselves: Either the tumor is supra-uterine and the hysterectomy is done in order to create a way of access; the *hysterectomy* is then spoken of as *preliminary* or the tumor is rather more intrauterine and its excision may be carried out without a preliminary hysterectomy. But this removal leaves a denuded uterus, badly fixed, and the *complementary hysterectomy* is required. In the latter case hysterectomy has the advantage of creating an extensive drainage canal.

In spite of some successes obtained with this manner of operating, relative successes really, since Segond had two deaths in twenty-five cases, making a mortality of 8 per cent., we believe that the abdominal route is less grave and should be done whenever we are in the presence of tumors, manifestly of the adnexa, however small they may be. We must apologize for the long dissertation on vaginal hysterectomy.

The great place it has occupied in the history of gynecology justifies the developments we have consecrated to it. While convinced partisans of the abdominal route in the immense majority of cases, we believe that vaginal hysterectomy may still be of great service in particular cases.

In inveterate uterine prolapse with extensive lesions on the cervix, in certain cases of irreducible uterine inversions, in rare acute or virulent pelvic suppurations, where colpotomy is insuf-

[1] Segond, Bilateral Tumors of the Adnexa that are Suited for Excision by the Vaginal Route after Hysterectomy. *Revue de gynecologie*, Paris, 1897, p. 205.

ficient to arrest the march of invasion of the disease, and in puerperal infection, vaginal hysterectomy preserves its superiority. It is even indicated in certain cases, ordinarily justifying the abdominal route, when, for example, the patient is very stout and the uterus is small, mobile and may be so easily extirpated from below.

The annoyance to the operator of adipose excess of the abdominal wall, and the difficulty of obtaining a quiet anesthesia with regular breathing are strong arguments in favor of vaginal hysterectomy.

We will not insist on the choice of procedure as it depends on the case; that which we have already said in reference to each enables one to decide what to do without our returning to the question.