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## THE TECHNIQUE OF VAGINAL HYSTERECTOMY.

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THERE is a growing tendency among gynecologists at the present time to attack by way of the vagina pathological conditions of the female pelvic organs formerly approached by cœliotomy. The chief arguments advanced in favor of the new departure are: the lesser shock of the vaginal operation, the absence of an abdominal cicatrix, and the avoidance of a possible hernia. The principal disadvantages of the vaginal operation lie in uncertainties of diagnosis previous to operation and in the greater difficulties of the operation itself. The uncertainties of diagnosis we can scarcely hope ever to entirely overcome. In many, though not in all, cases of uncertainty of diagnosis prior to operation, the diagnosis may be made after incision of the pouch of Douglas with practically equal facility as after opening the abdomen above the pubis. The technical difficulties of the vaginal operation will probably become less as the operation is more frequently practised and as we become more familiar with one or the other or all of the various techniques.

Those who now perform cœliotomies for various purposes so successfully have attained their present expertness in the school of experience. Just so it is and will be with vaginal hysterectomy. By the vaginal operation, as the term is here used, is not meant simple incision or puncture, with or without drainage, or aspiration of pathological accumulations in the pelvis. The term is applied in bringing the vaginal operation in competition with the suprapubic operation in the performance of oöphorectomy, salpingectomy, and hysterectomy, singly or in any given combination.

This paper deals with the technique of vaginal hysterectomy with and without added salpingectomy, oöphorectomy, or salpingo-oöphorectomy. Vaginal hysterectomy will first be considered by itself, to be followed by a few remarks upon the added procedures.

The methods of vaginal hysterectomy are three in number:

1. Serial ligation of the broad ligaments.
2. The clamp operation.
3. Enucleation, with ligation of bleeding vessels only.

Each of the three methods may be performed with or without mor-





cellement. The general rule should be to remove the uterus entire, whenever its size permits of its delivery as a whole, through the vagina. Morcellement under these circumstances, except in cases of malignant disease of the cervix, is to be considered an inferior procedure; it comes into play only in cases in which the uterus is too large to be delivered in one piece through the vagina. The writer has had occasion to remove the uterus through the vagina for probably every indication on which the operation has been done, and has had personal experience with each of the various methods of vaginal hysterectomy.

The following descriptions of the various methods is based upon this personal experience: Vaginal hysterectomy by whatever method, and for whatever purpose, is best practised with the patient in the lithotomy position. The vagina must, of course, first be cleansed and disinfected as thoroughly as possible. The writer employs for this purpose scrubbing with mollin containing 10 per cent. of creolin, followed by sublimate douches. A perineal retractor is next inserted. The writer makes use of the speculum bearing his name. The metal-weighted speculum of the French school and Simon's speculum answer the purpose equally well. The latter has the disadvantage of requiring an assistant to hold it. Lateral retractors are a necessity; the anterior retractor I have thus far always been able to dispense with. An electric forehead-light will be found very useful in illuminating the depths of the pelvis. Until the peritoneum is opened irrigation is used to remove blood and débris and keep clear the operative field. After the peritoneum is opened, mopping with sterilized gauze, either in the form of serviettes or sponges, is employed. If the cavity of the uterus is known or suspected to contain pathogenic germs the cervix is dilated and the uterine cavity thoroughly washed with a strong (1:2000) sublimate solution. It is then packed with antiseptic, iodoform or sublimate, gauze.

Cases of malignant disease of the cervix which have progressed to ulceration require circumcision and removal of the entire broken-down mass, after which the instruments thus far used are discarded. The vagina is again washed, disinfected, and the hysterectomy completed with safely sterilized instruments and redisinfecting hands. After asepsis of the vagina and uterus have thus been secured, the first step in the operation, except in cases in which the uterus is removed for malignant disease, should consist of an exploratory incision of Douglas' sac. This incision is made for the purpose of either establishing or confirming the diagnosis. It is only dispensed with in cases in which Douglas' sac is so obliterated by adhesions that the latter cannot be safely separated in their entirety at this stage of the procedure. The next step of the operation, by whatever method attempted, is circumcision of the cervix. Except in cases of malignant disease this circumcision should be made as near as practicable to the lower end of the cervix. Hemorrhage from



the vaginal arteries is thus reduced to a minimum. The circumscribing incision must be carried low enough, at least, to avoid the bladder anteriorly. Posteriorly it should be continuous with the incision into Douglas' sac. The incision is carried clean through the mucous membrane into the submucous connective tissue. Up to this point the procedures already described are common to all the various methods of vaginal hysterectomy. From this stage on each method requires separate description.

1. *Serial ligation of the broad ligaments.* After separating the cervix from its surroundings for a short distance, so as to allow the tissues to retract somewhat, the bladder is dissected, bluntly or with scissors, from the anterior surface of the uterus until the vesico-uterine pouch is reached. In separating the bladder, always hug closely the anterior surface of the uterus. If it can be easily done at this stage the anterior peritoneal pouch is opened and the opening enlarged laterally by tearing. Ligation of the base of the broad ligaments, including the uterine arteries, is the next step. To insure inclusion of the entire arterial supply the armed ligature-carrier is best carried into Douglas' pouch and made to pierce the broad ligament from behind forward, emerging in the anterior wound close to bladder. Care must, of course, be exercised not to include the ureters. After the ligature is tied on both sides the tissues between the ligatures and uterus are severed with the scissors, and the uterus is dragged farther down toward the vaginal outlet. The next section of the broad ligament is now tied in a similar manner on either side and cut with scissors between uterus and ligature. The third ligature generally reaches to the top of the broad ligament, including the tube and round ligament on either side. A clip of the scissors between the topmost ligature and the uterine cornu on either side will liberate the uterus, which is now removed. If it is desired to remove tubes and ovaries with the uterus, they are drawn down, either after removal of the uterus or with the latter, and the topmost ligature on either side is applied to the broad ligament outside of the tubal ostium. Tubes and ovaries are then cut out between the ligatures.

2. *The clamp operation* differs in no wise from the method of serial ligation of the broad ligaments, except that hæmostatic forceps of various shapes and sizes, according to the fancy of the operator, take the place of ligatures. The uterus, with or without the tubes and ovaries, is cut out between the clamps applied to control hemorrhage from the broad ligaments on either side. The handles of each pair of forceps are tied with silk to prevent their opening, and the clamps allowed to remain from twenty-four to forty-eight hours, their handles being wrapped in antiseptic gauze.

3. *Enucleation with individual ligation of bleeding vessels.* After circumscribing the cervix by incision it is seized with strong volsella



forceps and drawn well down; or a stout silk ligature may be passed through the cervix to act as a guy-rope in drawing it down. The uterus is freed from its surroundings by blunt dissection, aided, when necessary, by incisions with a hysterectomy knife or scissors. The author's preference is for the scissors aided by a tenaculum. The tenaculum is hooked into and draws taut the tissues immediately adjacent to the uterus, while the scissors divides them as close as possible to that organ. After a fair and patient trial of the hysterectomy dissector, the writer has been unable to accustom himself to its skilful use. Blunt dissection, aided, when necessary, by an occasional clip of the scissors, is thus proceeded with until the origin of the tube from the uterine cornu is reached on both sides, the peritoneum having, as already stated, been freely opened anteriorly and posteriorly.

FIG. 1.



Cole's hysterectomy dissector.

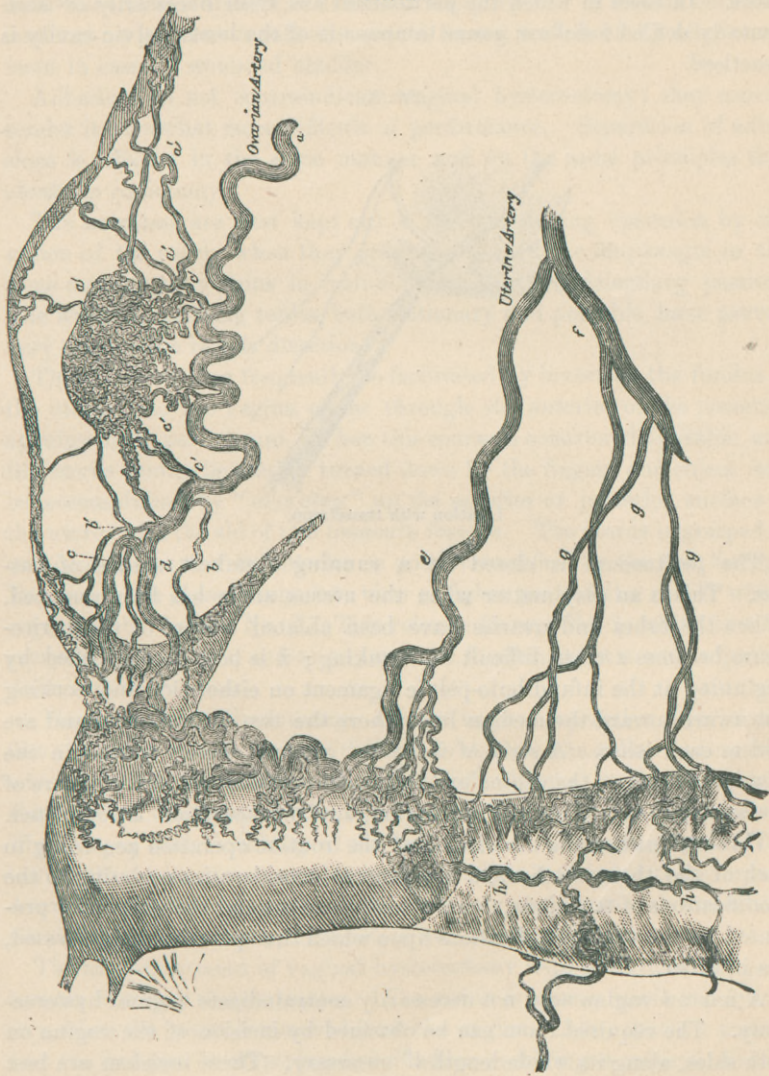
Two cardinal principles are involved in the successful performance of vaginal enucleation of the uterus. The first is to carry the dissection as close to the uterus as possible. Hemorrhage is thus reduced to a minimum. The uterine arteries as they approach the uterus divide rapidly into smaller and smaller tortuous branches—the curling arteries of the uterus—which finally penetrate the uterus as arterioles of the smallest calibre. By dissecting very close to the uterus, we divide only these arterioles or capillaries, and the slight oozing from them almost immediately ceases spontaneously. In working further away from the uterus, larger vessels, requiring ligation, are divided.

The second cardinal principle involved is always to keep your immediate work well in view in the centre of the field of operation; to seize with forceps any spurting vessel that may happen to be divided and to immediately secure it with a slender catgut ligature. It will not do, however, to tie the ligature around the artery in the usual way. The danger of retraction of the artery and slipping off of the ligature is too great, and when the artery has once retracted outward into the folds of the broad ligament, it may become a serious and difficult task to again secure it. To be on the safe side, the transfixion ligature (*Umstechungsligatur*) must be employed. The bleeding mouth of the artery is seized with forceps and slight traction made upon the vessel. This puts the tissues about the artery upon the stretch, and a needle carrying the ligature is passed underneath the artery, piercing in a part of its course the connective tissue surrounding the vessel. The ligature is then tied upon



the side of the artery opposite to that on which the connective tissue has been pierced. A ligature thus tied cannot slip off.

FIG. 2.

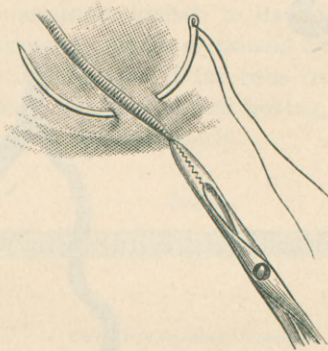


The ovarian, uterine, and vaginal arteries (HYRTL): *a*, ovarian artery; *a'* and *b'*, branches to tube; *b*, branch to round ligament; *c*, uterine artery; *c'*, branches to ovary; *g*, vaginal artery; *h*, azygos artery of vagina.

If it is desired to ablate the tubes and ovaries, the same blunt dissection, aided when necessary by the scissors, is carried close to the tubes and ovaries until the infundibulo-pelvic ligaments are reached. Divided

bleeding vessels are separately secured by fine catgut ligatures. In all clean cases closure of the peritoneum is the next step of the operation, except in the clamp operation, in which an efficient closure is impracticable. In cases in which the peritoneum has been necessarily or accidentally defiled iodoform gauze tamponade of the lower pelvic cavity is practised.

FIG. 3.



Ligation with transfixion.

The peritoneum is closed by a running Lembert suture of catgut. This is an easy matter when the uterus alone has been removed. When the tubes and ovaries have been ablated closure of the peritoneum becomes a more difficult undertaking; it is best accomplished by beginning at the infundibulo-pelvic ligament on either side and working downward toward the median line, where the two sutures meet and are tied to each other. A strip of iodoform gauze is loosely placed in the raw space between the vagina and the closed peritoneum. A little more of the same gauze is placed in the vagina, and the operation is completed.

Having finished the description of the routine operation according to each of the three methods, a few general considerations relating to the modifications of technique, to meet complications and the exigencies presented by the various indications upon which the operation is performed, are in order.

A narrow vagina need not necessarily contraindicate vaginal hysterectomy. The required room can be obtained by incision of the vagina on both sides, along its whole length if necessary. These incisions are best made in the postero-lateral direction. After completion of the operation the vaginal incisions are closed by suture.

In cases in which the uterine cavity contains infectious material the cervix may be closed by suture as a precaution additional to the sublimate irrigation and gauze tamponade of the uterus, prior to proceeding with the operation.



Should the bladder happen to be wounded, the injury is immediately repaired by suture. A running suture of fine chromicized catgut in two tiers, the deep tier extending down to but not penetrating the mucous membrane of the bladder, will answer the purpose. Frequent catheterization, or a permanent catheter, should form a feature of the after-treatment in cases of wounded bladder.

Adhesions do not contraindicate vaginal hysterectomy; they merely render it somewhat more difficult of performance. Separation of adhesions is effected in the same manner and on the same principles that obtain in cœliotomy.

The intestines are best kept out of the way during operation by elevation of the pelvis, when they gravitate toward the diaphragm in the same manner as obtains in cœliotomy in the Trendelenburg posture. The writer's operating tables, both stationary and portable, have proved very serviceable in this direction.

The operation may frequently be facilitated by inverting the fundus of the uterus into the vagina either through the anterior or the posterior opening in the peritoneum. When this course is considered desirable, and the uterus cannot be readily turned down by the fingers, our object may be accomplished by "climbing" up the anterior or posterior surface of the uterus with the aid of two tenacula forceps. The uterus is grasped at an accessible part of its anterior or posterior surface by the first forceps. Traction upon these brings into view a higher part of the uterus which is grasped by forceps No. 2. This releases forceps No. 1, which in turn grasps a higher part, and so on until the fundus appears and is pulled down into the vagina.

The one great disadvantage of the vaginal operation lies in the fact that it is sometimes very difficult to remove the tubes and ovaries when such removal is indicated. This difficulty and indication obtain chiefly when the diseased adnexa are adherent high up in the pelvis. The atrophy and shrinking of the tubal and ovarian attachments following the menopause may also render it difficult to bring these organs down into the field of operation for removal; their removal under this circumstance is, however, fortunately but rarely called for.

The after-treatment of vaginal hysterectomy with closure of the peritoneum is a very simple matter. The urine is drawn until the fourth day, when the gauze is removed from the vagina. After that the patient uses the bed-pan in emptying her bladder, receiving a vaginal douche of 1:3000 sublimate immediately after each urination. When the peritoneum has been left open and tamponaded with iodoform gauze, this gauze is removed on the fourth day, and a small quantity of fresh iodoform gauze introduced. This is removed on the seventh day, after which the vagina is douched after urination, as in the cases with closure of the peritoneum. Patients may sit up from the ninth or tenth day on, and



generally leave the hospital at or before the end of three weeks after operation.

The three methods of vaginal hysterectomy above described may be properly designated as the German, the French, and the American. The Germans, almost to a man, practise serial ligation of the broad ligaments. The prominent exponents of the French school, following the lead of Péan, swear by the clamp. Enucleation with simple ligation of bleeding vessels, although probably practised in isolated instances elsewhere, first became established as a routine procedure in our own country, where it is rapidly gaining adherents. To Pratt, of Chicago, belongs the credit of having by his practice demonstrated the practicability and value, and by his teaching and writings disseminated a knowledge, of the method which justly bears his name. As already stated, the writer has practised each of the three methods. The clamp operation he soon abandoned, as to his mind eminently unsurgical. He has no further use for it, and will not again leave a clamp in the body except in the dire necessity of being unable to secure a bleeding point by ligature or torsion. Serial ligation of the broad ligaments presents the serious objection of unnecessary constriction of vital tissues richly supplied with nerves, bloodvessels, and lymphatics. Ligation is required merely to check hemorrhage, and this object can be accomplished by simply tying the bleeding vessels; all constriction or crushing of tissues beyond this is uncalled for, harmful and illegitimate. Vaginal hysterectomy by serial ligation of the broad ligaments is indicated only in cases of malignant disease in which we wish to give the uterus as wide a berth as possible. Enucleation of the uterus, with ligation of bleeding vessels only, appeals to my mind as a surgically ideal method of hysterectomy, suprapubic and vaginal. All my cases operated upon after this method, one abdominal and nine vaginal hysterectomies, have made good recoveries. The first vaginal hysterectomy bears date of May 18, 1894.







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