

TECHNICAL MEMORANDA.

(Under this heading will be published from time to time notes on points of practical interest in regard to methods of treatment, operative and therapeutic, and on the general management of Obstetrical and Gynæcological cases in hospital and private practice.)

Hysterectomy by Two Suture-Ligatures.¹

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A STUDY of the elimination of waste motions in gynæcological work has been a part of very full notes taken for some years in occasional trips among the clinics of four countries, and in the writer's own operating rooms. How time can be saved with an accompanying increase—not loss—of safety, efficiency and finish is the liveliest issue in all other crafts, and must be studied in our own. All the way from printed directions for our office patients up to methods of retraction and dissection in the most radical cancer operations there is hardly a detail that is unworthy of consideration. Because of our fifteen minute rule, I must here pass by observations from no small number of operating rooms on equipment, organization and team work, from many offices and out-patient departments on diagnosis and treatment, and omit methods adapted or adopted by the writer, such as simplified, truly intrauterine stems for antelexion and sterility; easy artificial impregnation; appendicectomy by the single self-inverting "clock-face" suture; cervix repair and cervix amputation by two continuous sutures instead of a tangle of interrupted multiple ties; pelvic floor restorations, primary or secondary, with a single three-layer suture and two knots in all, with its scar invisible by the use of the subcuticular layer; complete amputation of the umbilical cord at the skin edge at birth, with primary union, by a single suture-ligature or serrefines—and other matters of abbreviated efficiency.

This paper will be restricted to simplifications in retraction, in safe-guarding wound edges, in dissecting, in ligating, in suturing and in minimizing of knots in hysterectomy, and almost entirely to the details of vaginal hysterectomy.

1. Read before the Section on Obstetrics and Gynæcology of the International Congress of Medicine, London, August 1913.

Shield retractor. Of the large number of laparotomies seen, no satisfactory guard of the wound edges was observed. Most operators ignore the rough usage involved in dragging at or rubbing past the rim of the laparotomy well. The complete protection furnished by the all-metal square retractor of Franz is inflexible; the cover of oiled silk between two layers of gauze sewed over the wound by Sigwart is thick and becomes pervious; and the effective thin rubber sewed on by Berkeley and others slips about. A fair retractor and a perfect shield for the cut layers and the skin is afforded by a circle of stiffish rubber, reaching an inch within the peritoneal cavity and four or six inches on to the skin, held open by two thin horse-shoe springs bedded in the rubber, one inside the abdomen and one without (Fig. 1). For vaginal work the anal region is covered by a rubber apron sewed or clamped in place.

Dissection. In opening up layers and connective-tissue spaces the Germans snip very freely; very many surgeons in England and America use the gauze-covered finger. The employment of the blunt scissors is a Mayo practice perhaps too little employed. In hernias and cancer hysterectomies the field for this device is wide. Certain dissections of the broad ligament layers are entirely avoidable by the suture-ligature before or while cutting away. This will be noted further on.

Ligation and suturing. One may be pardoned, perhaps, for drawing attention to the rather wide prevalence of two practices that are generally admitted to be wrong in theory. In ligation we now know that the artery needs no crushing, but merely apposition of the walls—yet time and muscle are often seen wasted. In suturing, also, minimum pressure is the motto—coaptation—not compression, not strangulation. It is curious to note that with fine catgut comes, instinctively, catgut gentleness. You can spot the silk user by his drag, by his catgut breaks, by his thick, hard gut. You will see in some places at the end of operation what it is little exaggeration to call scallop-shell wounds. A gutter, or valley, shows for each stitch, with a not inconsiderable ridge between the bristling knots. Contrast this with the evenly-rounded surface of a cervix with cut edges coapted tenderly, or of a perineal or abdominal skin surface held by layer suture or subcuticular suture.

Another study in suturing is the use of a running suture wherever it is applicable. A knot is a nest—a germ nest. A stiff or thick knot is an irritant, the centre of an exudate. Let us study to minimize the number of our knots.

A third live issue is the buried or layer suture where it can be used. Any stitch running from the skin into deeper layers bears seton possibilities. Even though it be impervious yet in principle it bears some resemblance to a drainage strand. Interrupted stitches, stay stitches, buried knots, silkworm, fine silk, linen, silver wire, all

have places of great value. One can pay too high a price for simplicity and absorbability. Yet must we ever look toward these ideals when we sacrifice thereby neither safety nor efficiency nor finish.

Abdominal Hysterectomy.

These general principles, applied to removal of the uterus, bring about—first, marked reduction in the time of operation by combining tractor and suture and ligature in one; second, absence or lessening of raw areas of opened-up broad ligament; third, anchorage of the round ligament, and in appropriate cases the utero-ovarian ligament (or even the ovario-pelvic ligament), to or into the stump of the cervix or vagina in order to swing the stump high; fourth, minimum number of knots and of bulk of foreign material.

The first bite of the suture is usually that which circles the round ligament (Fig. 1). The second stops bleeding from the ovarian artery (Fig. 2). In each case care is taken to bite into and lock into tissue so that the ligature does not slip off a bared vessel. In every case and with every bite the loop must be snugly nestled home without slack or jump or stretch of gut between the bites, except as noted hereafter. Reflux being checked by a clamp on the uterine side, the upper vessels are cut away (Fig. 3). The thin part of the broad ligament is scrutinized. If it exhibits a bunch of varicose veins, sweep number three should encompass them (Fig. 6). We now cut away down toward the uterine, shoving back the bladder in front and peritoneum behind to bare or nearly bare the artery. The next sweep circles it (Fig. 3) and locks home (Figs. 7 and 8). The vessel is cut. The last sweep of the stitch as a ligature circles the vessels just to the side of the cervix (Fig. 4), and should get some grip in cervical or vaginal tissue for traction purposes.

Now one may with advantage repeat the procedure from the opposite side (Fig. 6). And for this reason. These suture-ligatures make convenient cervix tractors, and we may often dispense entirely with other clamps than those used to prevent reflux bleeding. Next, the uterus is cut away, taking care to cone the cervix in such fashion as to leave little or no cervical canal (Fig. 5). The cervix stump swings between two tractors, namely, the ligatures. One of these next approximates the two faces of the cervix crater, taking care to turn into this raw surface the cut ends of the round ligaments (Fig. 7), and it is then tied to its fellow of the opposite side. Finally, the second suture becomes the peritoneal suture and closes in all raw areas (Fig. 9). At any step in the process one may tie the strands, then go on with them. When the cervix is to be removed the same procedure holds good, substituting the word vaginal edge for cervix crater.

The procedure may sometimes be reversed. In such case one

removes the uterus between clamps, coning out the cervix or removing it. The work is then begun by sewing the raw surfaces of the cervical cone together (or whipping the round of the vaginal opening), next circling the lateral vaginal vessels, then securing the uterine, next the round ligament, lastly the ovarian vessels.

The same principle is applied to large uterine and ovarian tumours and pustules, and to broad ligaments however distorted, by a variation in the procedure. Whenever there would be, between one artery and the next, a gap or space, and this would be crossed by a span of catgut that could not bedrawn taut, each artery can be securely grasped without altering the principle of this method. The vessel is to be caught in one loop, and afterward by a second—the second locking the first by the familiar clove hitch (Fig. 8).

Thus between the location of secure ligations on several vessels there can be lines or areas of mere suturing, all cared for by the same running strands (Fig. 8). The advantage is not only simplicity and speed, but also this: one does away with the curious and general practice of laying open wide raw spaces of connective-tissue and then covering them in later. By coapting before cutting—or immediately on cutting—one closes the denuded areas, as it were, before creating them. One other common habit may be mentioned. Except when it is unavoidable it is hardly good mechanics to clamp vessels on the pumping side, to remove the tumour, and, after an interval, take off the clamp and hunt for the vessel ends. They are concealed. They may retract. They are temporarily compressed and give a false sense of security. And, moreover, one dabs and dabs at raw surfaces. To ligate before cutting and to avoid scrubbing bared areas is right surgery. The ligature suture fosters both.

Vaginal Hysterectomy.

In operations where major matters are settled our concern is with the details that make for speed and safety, finish and simplicity. To simplify is to popularize. To foster vaginal as against abdominal removal of the uterus (whenever conditions are suitable) is to minimize shock and lower mortality, to do away with most adhesions and all suprapubic hernias, and to restore women to their work far more quickly.

The drawbacks to the lower route have been slowness and fussiness; occasional slipping of ligatures; oozing from broad ligament bases that spread wide open and retract into the bloody dark and wide raw areas left uncovered by peritoneum.

If, however, by means of a long suture-ligature-tractor for each side—of fine, plain catgut, doubled—one sweeps about the vessels while he closes together and climbs and pulls down broad ligament, all by steps in the same process; then cuts the uterus out; thereafter, with one of the same stitches sews the ligament masses together,

closes the peritoneum of the cul-de-sac, and cares for the posterior vaginal gap; with the other unites the anterior peritoneum, anchors the bladder, and cares for the longitudinal vaginal incision, all by running continuous suture—he has, by a succession of well-reasoned movements, planned for the four requisites. The steps are as follows:—

1. Choice of a case suitable for vaginal hysterectomy, adding, in certain instances where vulvar narrowness is the only objection, free incision of the pelvic floor (Schuchard).

2. Selection, for each side, of a long (20 inch) suture of light catgut, such as No. 1, either plain or chromic, double, knotted, on a strong non-cutting needle like a Mayo.

3. The cul-de-sac is opened and the peritoneal gap stretched, or the stalk of a T-incision is carried down the posterior vaginal wall to the bottom of the cul-de-sac, as located by the hooked-in finger tip.

4. Through the anterior cut the bladder is pushed part way back; the anterior vaginal wall is split and freed from the bladder, and the finger works the bases of each broad ligament down to a ligatable quantity.

5. The long suture swings near to or about the utero-sacral ligament and out near the lateral vaginal wall to anchor the loop ready to be tightened. Cervix and stitch are pulled in different directions and a cut made between. This, or a second loop and cut, takes us close to the uterine artery. This sweep bites into tissue to anchor it and then circles the artery, is looped and carefully nestled home and kept taut by the assistant (Figs. 15 and 10). Rarely a second, or locking loop, is employed. Next, the opposite side is treated in the same way. Now the uterus comes down so that the anterior peritoneal pouch is accessible for opening and widening. The fundus is drawn out. The suture either takes two more bites, round ligament in one (Fig. 11) and tube and ovarian ligament in the other (Fig. 16), before one side of the uterus is cut free or else a clamp is applied and after the uterus is out these stitches are taken. One must be careful to puncture and grip good tissue to prevent slipping, for example, in the ovarian ligament. The upper end is now tied, shortening the broad ligament. The suture is not cut, however. The opposite side is treated in the same fashion. Care must be taken that in the jump between the ligating loops safe-guarding the lower portion of the broad ligament and those controlling the ovarian and round ligament vessels, there be no slack or span (Fig. 16). In one's earlier trials of this method one may desire to interrupt the continuous suture to tie the uterine with it, then continue upward with it. The tubes and ovaries are left, if desired, or removed by using the fourth or fifth sweeps of the stitch.

ABDOMINAL HYSTERECTOMY BY TWO SUTURE-LIGATURES: DICKINSON.

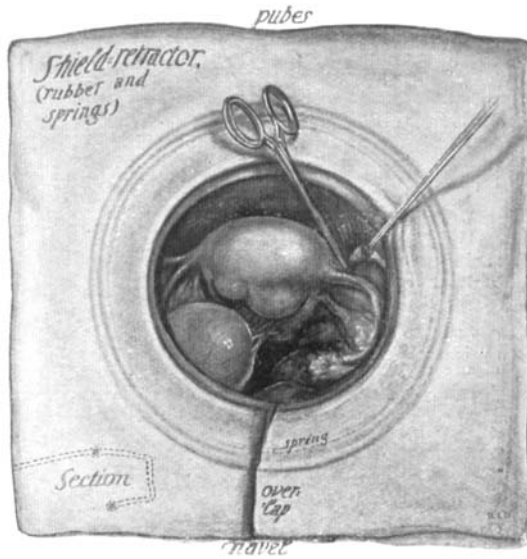


FIG. 1.

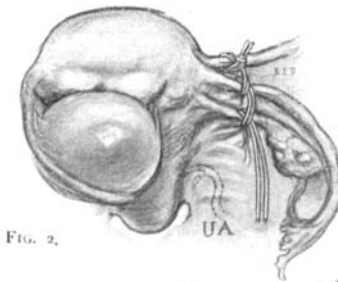


FIG. 2.

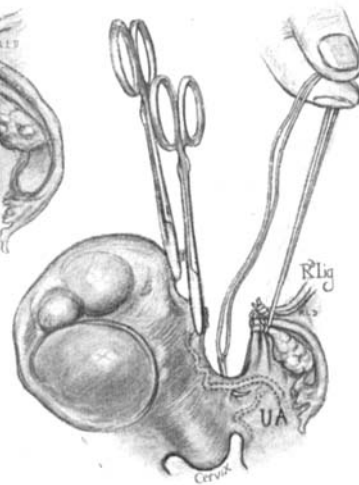


FIG. 3.



FIG. 4.

FIG. 5.

FIG. 6.

Each loop is drawn taut before proceeding, and kept taut, serving also as tractor. FIG. 4—Cervical (or vaginal) vessels caught. FIG. 6—The work may be either front or back of broad ligament. FIG. 7—Into the deeply coned cervix (or open vagina) the round ligaments are made fast.

ABDOMINAL HYSTERECTOMY BY TWO SUTURE-LIGATURES: DICKINSON.

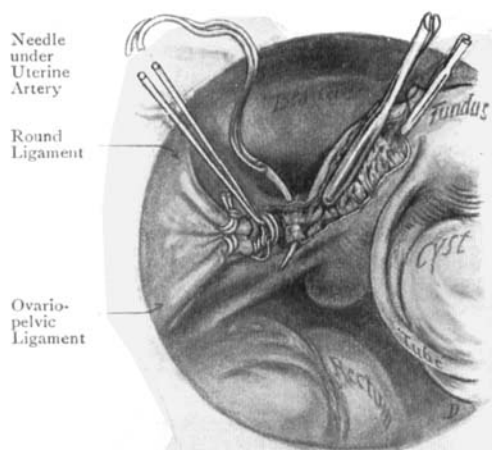


FIG. 8.

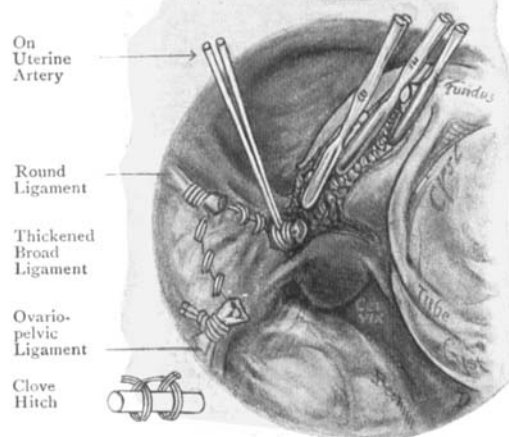


FIG. 9.

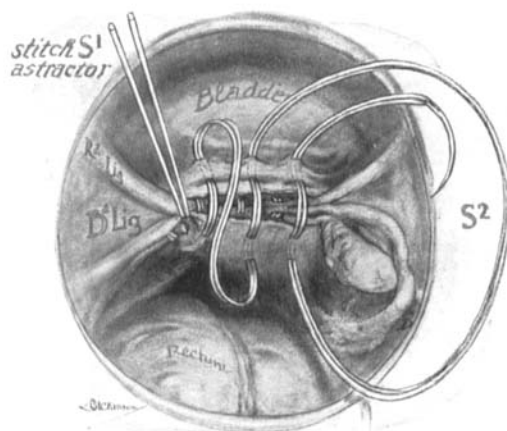


FIG. 10.

View into pelvis—the stitches here drawn thick and large—to show closure of broad ligament at each step of the ligation, and effective tractor action. FIG. 9 pictures the double bite, or clove hitch, used when any slack or line of delicate stitching intervenes between ligature action. FIG. 10—Diagram of peritoneal apposition over stump.

VAGINAL HYSTERECTOMY BY TWO SUTURE-LIGATURES: DICKINSON.

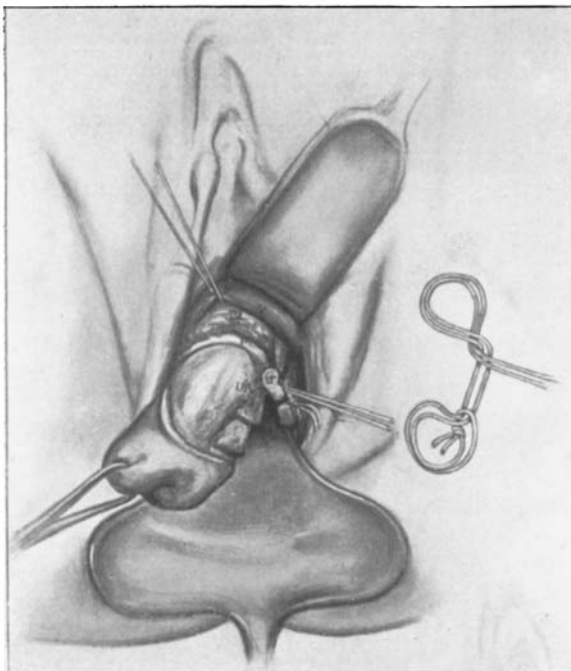


FIG. 11.



FIG. 12.

The continuous doubled suture climbs the broad ligament; the second loop, here rested home, circles uterine artery (UA). Second cut of ligament has been made. Tractor action shown. FIG. 12—A small fundus may be extracted, then round ligament, then tube and ovarian vessels grasped by lock stitch. Or uterus may be first bisected. Or, on upper section of broad ligament, lock stitch may follow clamp and cut.

VAGINAL HYSTERECTOMY BY TWO SUTURE-LIGATURES: DICKINSON.

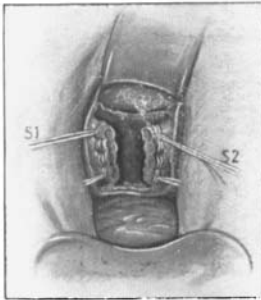


FIG. 13.

Quilted broad ligaments ready to be sewed together. After anterior peritoneum is closed (not shown), bladder is sutured to top or rear of this strong bridge, Fig. 12. Cul de sac whipped over, then transverse and longitudinal vaginal openings approximated, catching the vagina up to the ligaments also.



FIG. 14.

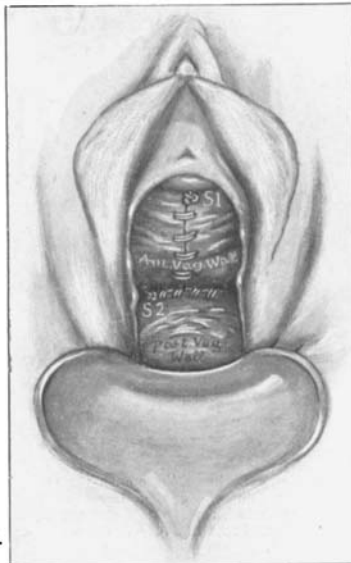
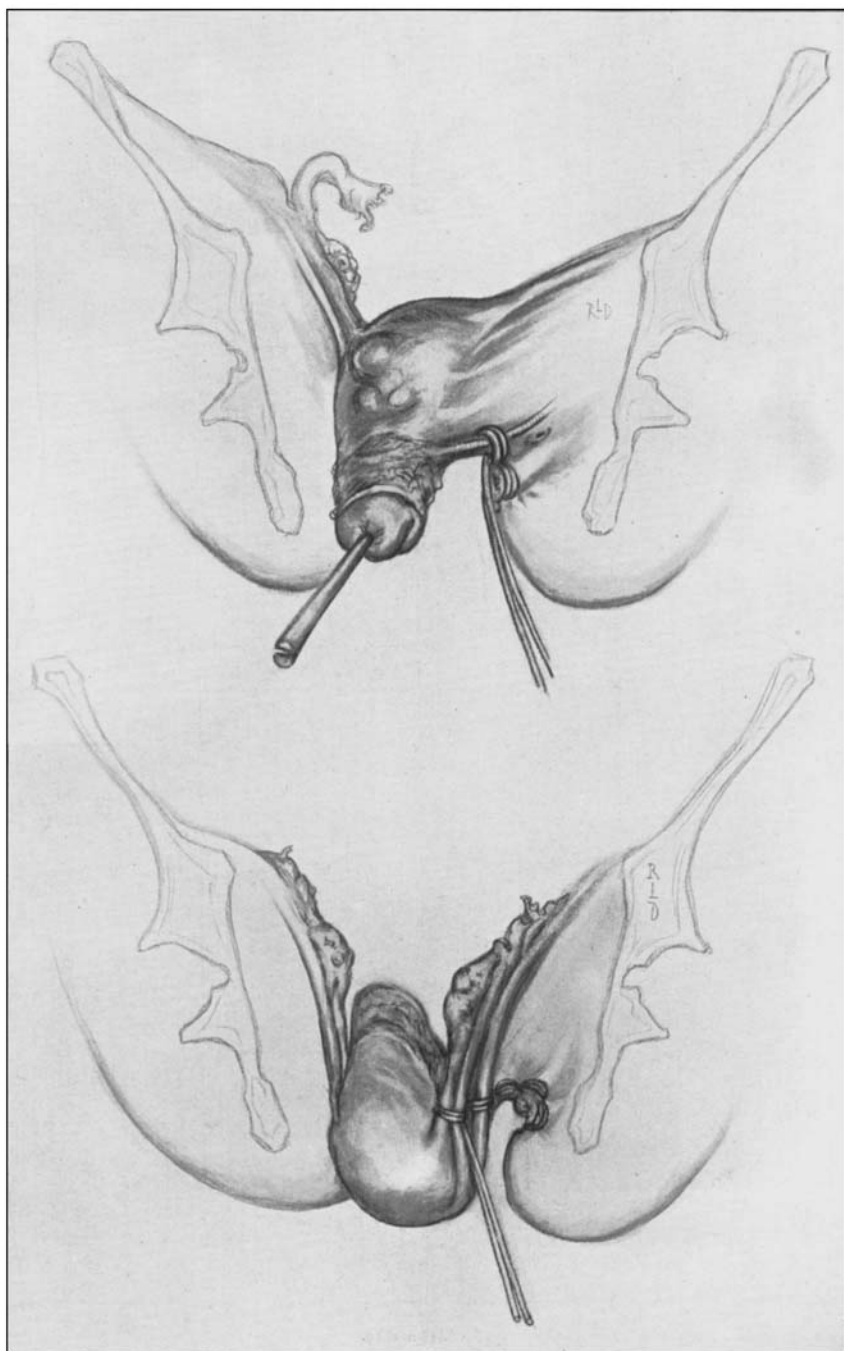


FIG. 15.

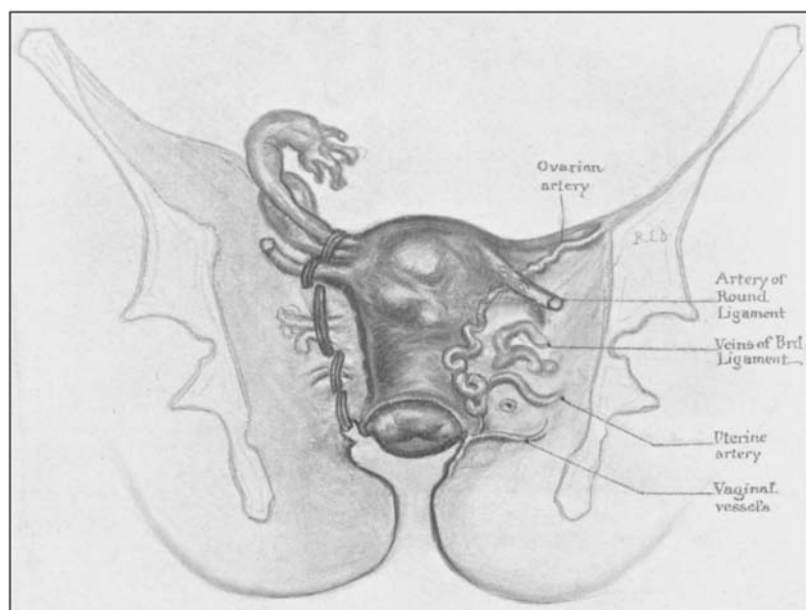
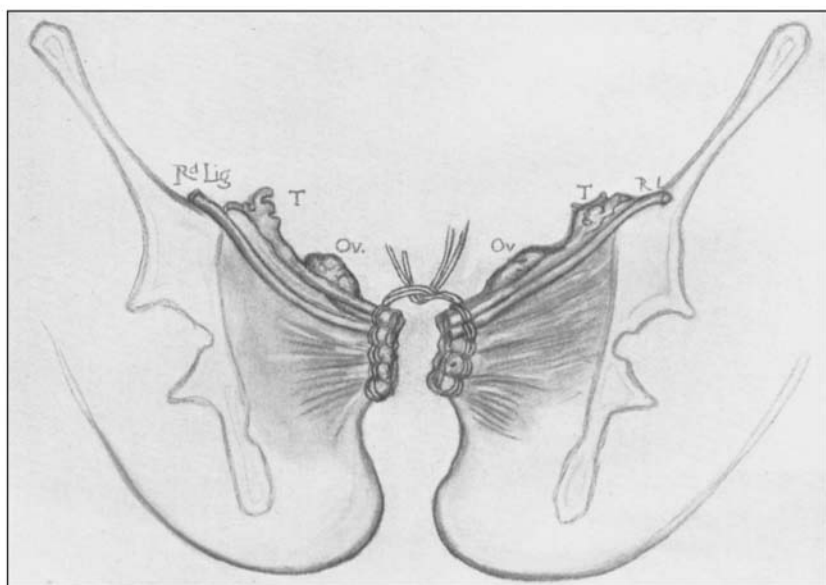
VAGINAL HYSTERECTOMY BY TWO SUTURE-LIGATURES: DICKINSON.



FIGS. 16 and 17.

The suture as tractor. The uterine artery looped before cutting. Below, the last suture ligature placed before the uterus is cut away. All five seizures are close together.

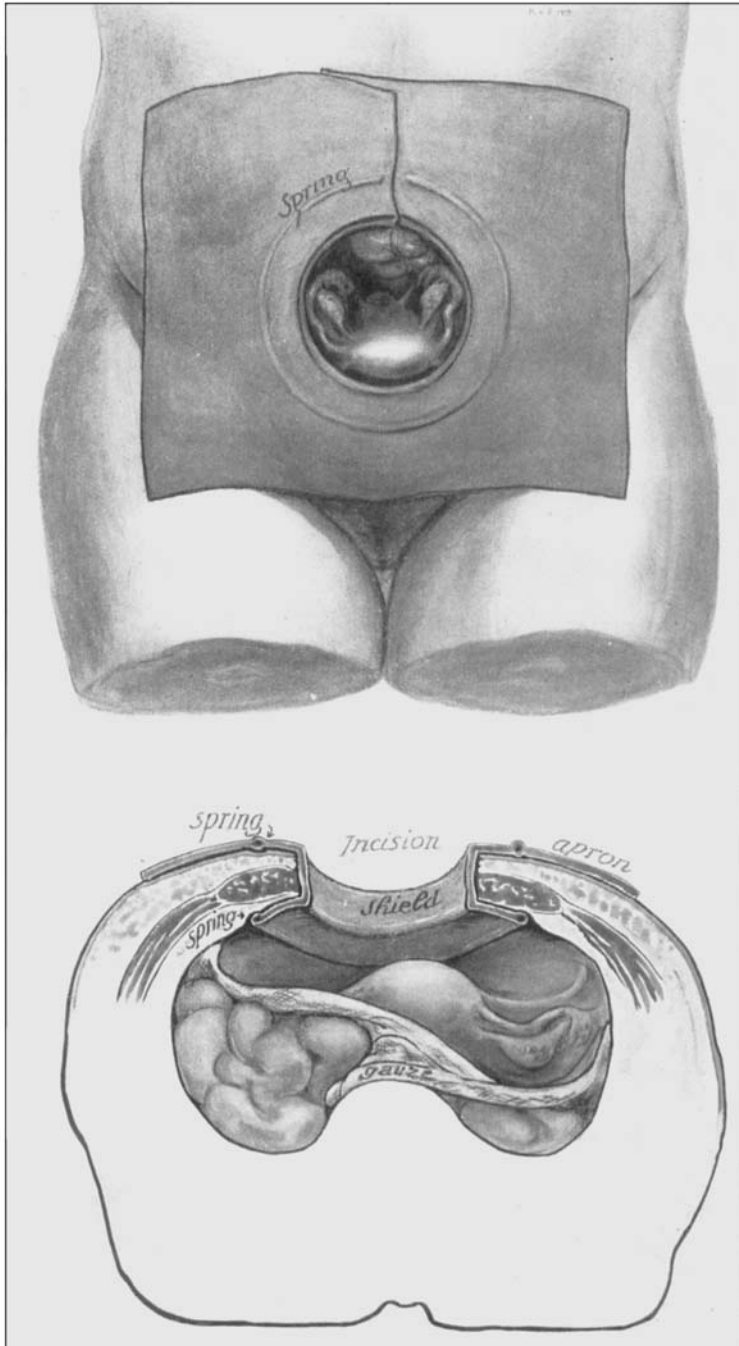
VAGINAL HYSTERECTOMY BY TWO SUTURE-LIGATURES: DICKINSON.



FIGS. 18 and 19.

Above, the uterus having been cut away and each ligature tied on itself, the two may be tied together, to form the bridge to which bladder and vagina are sewed. The lower diagram shows the vessels on one side and the upward slope of the interlocking suture on the other.

ABDOMINAL HYSTERECTOMY BY TWO SUTURE-LIGATURES: DICKINSON.



FIGS. 20 and 21.

The shield-retractor prevents skin contacts and friction and contusion of the faces of the laparotomy incision, and serves as a fair retractor. Metal retractors may supplement it. Incision may be lengthened without removing.

Long broad ligaments may require more than four dips of the suture, or more than one suture, particularly when the tube and ovary do not come down well.

6. One needle is now used to close the bladder peritoneum and then the broad ligaments together (Figs. 17 and 12), the other to close the vaginal wall. The more careful the coaptation of mucous membrane the less chance of tender granulation in the vaginal scar. The peritoneal cavity is shut off by this sewing together of the broad ligaments and bladder peritoneum. The vaginal vault and bladder are anchored high to the front face of the broad and round ligaments by these sutures. In an empty pelvis a light vaginal pack may lift the further end of the vagina, but it is not necessary, nor is a drain always used.

7. If cystocele has existed, the bladder base is sewed with one of the above sutures or with No. 1 chromic catgut to the round ligaments or to the top of the bridge of the broad ligaments. In case of prolapse of the bladder its base should be carefully carried over and back of the top of the bridge (on its upper, rearsurface) (Fig. 12), and then another tier or a catch or two makes fast to the anterior face of the ligament bridge. All slack is to be taken out of the anterior vaginal wall.

8. If the bladder or vaginal wall lack support, as is usually the case, a firm posterior vaginal wall above an ample perineal body is to be built.

In simple cases, two sutures suffice. I sometimes use more. It is spoken of as a two suture method because the work usually can be done thus. There has been no slipping, no hæmorrhage, no death, in a series of twenty-two cases, and suppuration in only two cases. In old women a tiny cigarette-drain of gutta-percha tissue over gauze is left in two days or more. No vaginal pack is used where a pelvic floor is restored.

These methods are for the expert. He may, perhaps, at the first trial for his peace of mind combine a ligature with this suture. The confidence with which the device has been applied to intra-abdominal work I owe to Dr. F. F. Simpson, of Pittsburg, whereas the vaginal procedure described above is an embroidered variant of the operation of Dr. J. Riddle Goffe, of New York.