A VAGINAL HYSTERECTOMY TECHNIQUE FOR THE CURE OF PROLAPSE OF THE UTERUS WHEN THE REMOVAL OF THE UTERUS IS NECESSITATED

WITH SPECIAL REFERENCE TO LAPPING OF THE VAGINAL FASCIA IN ALL FORMS OF VAGINAL PROLAPSE[1]

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IN an article read by me before this society at its last meeting describing a subtotal vaginal hysterectomy technique for the cure of procidentia uteri, I reached the conclusions that (1) there was encountered in it an element of danger to life, as the result, probably of necrosis of the reconstructed uterine body, which did not justify its further use; (2) that the interposition of the reconstructed body added nothing to the result when success was obtained; (3) that the essential features in the successes were the approximation of the cut surfaces of the cardinal ligaments and the correct readjustment of the fascial structure of the anterior vaginal wall.

My object in this communication is to make a preliminary report of a vaginal hysterectomy technique for the cure of prolapse of the uterus where the removal of the uterus is necessitated and to advocate the principle of fascial lapping in all forms of vaginal prolapse. The initial steps of the hysterectomy technique will be recognized as identical to those described in my previous study. The method of lapping the fascia described in the following sentence will be recognized as a plan of procedure suggested by me in the article referred to. "Sometimes the anterior vaginal wall, like the uterus, is considerably hypertrophied. When this is the case the mucosa can be removed in part from one lateral strip and the strips lapped so as to give additional strength."

It was not until December 11, 1917, and January 17, 1918, that there came under my care cases which conformed to the above description; namely, great hypertrophy of the uterus and vaginal wall and complete procidentia. A report of these cases and of the operation performed for their relief was made before the New York Obstetrical Society February 12, 1918, and a description of the procedure which was followed will be published in the June issue of the *New York Journal of Obstetrics*.

VAGINAL HYSTERECTOMY AND FASCIAL LAPPING FOR PROCIDENTIA UTERI

Two curved incisions, meeting in front and behind, are made about the cervix at its juncture with the vaginal mucosa. The vaginal tissue is separated from its cervical attachments and each cardinal ligament area of tissue severed from the cervix and penetrated and tied with a chromic gut suture No. 2. As the free ends of these sutures are to be used at the completion of the operation forceps are now attached to each group.

The vesicofascial area may be entered by either a longitudinal incision or by the curved incisions as they pass above and to the sides of the cervix. The preferable approach to this area of cellular tissue is through the curved incisions. When this area or line of cleavage between the bladder and fascia is found it is followed by blunt dissection on each side of the lateral limits of the anterior vaginal wall. The so-called vesico-uterine ligament, which is but a part of the vesicovaginal fascia, is next severed and the bladder separated entirely from its fascial attachment starting below and working upward. As the freeing of the bladder from the fascia is continued toward the urethra the anterior vaginal wall is incised in the median line until the blending of the fascia with the urethral tissue is reached.

The posterior surface of the bladder is now completely separated from the anterior wall of the cervix and the peritoneal reflection incised. The tissues between the cervix and
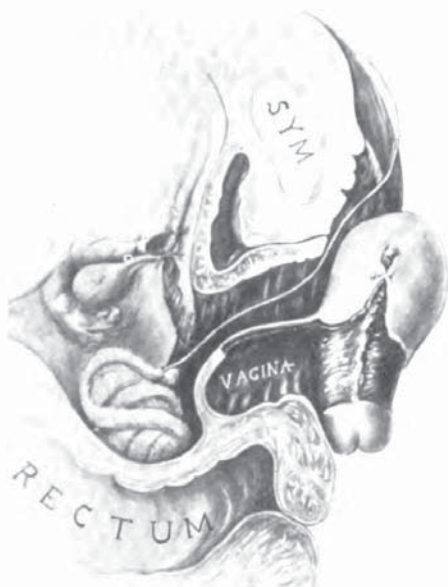
Fig. 1. Showing the uterus out of the vagina with all its attachments severed except the posterior vaginal barrier, which barrier with the gauze strip passed through the anterior opening, prevents the vaginal contents entering the peritoneal cavity.

the rectum are likewise separated, but the posterior peritoneal reflection is not incised.

The corpus uteri is now delivered through the anterior peritoneal opening and a narrow strip of gauze, to which is attached a piece of catgut, is passed into the peritoneal cavity to protect it and prevent the intestines and omentum from protruding.

The vaginal flaps are next prepared for lapping by first trimming them longitudinally to not less than half their original size. From the right flap, or that to the left of the operator, the mucosa is completely removed. This flap is severed crosswise near its urethral attachment to the extent of about 0.5 centimeter so as to facilitate its adjustment when anchoring it under the opposite flap.

Four or more mattress sutures of chromic gut No. 2 are now inserted in such a manner as will anchor this denuded flap under the undenuded flap and to the opposite stable line where the fascia meets the lateral limit of the vagina. Four or more interrupted chromic gut sutures No. 2 and a continuous suture are used to anchor the undenuded flap
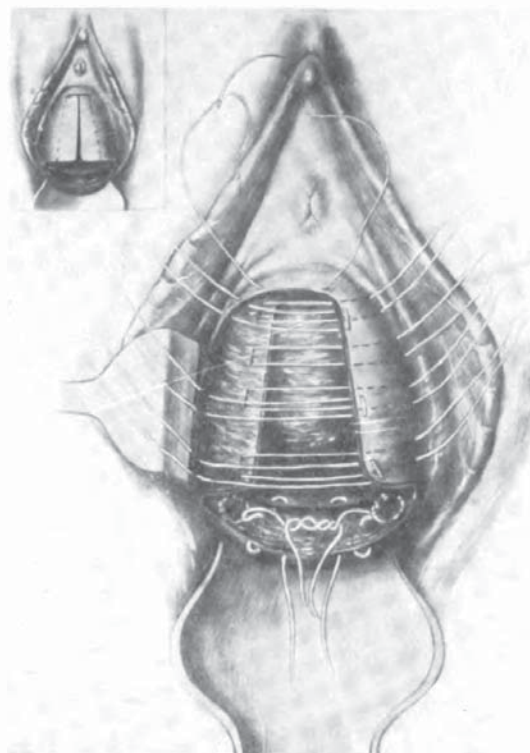

Fig. 2. The marginal insertion in the upper left hand corner shows the initial incision of the anterior vaginal wall and the opening in the vault of the vagina on the removal of the uterus. The dotted lines indicate approximately the amount of tissue removed longitudinally from each flap.

The larger illustration shows the underlapping flap denuded of its mucous membrane and the sutures placed for anchoring both flaps. A bundle of tissue is seen on each side of the vault of the vagina, encircled by a chromic gut suture. One strand of each suture is passed in and out along posterior vaginal cut surface to control hæmorrhage and the other tied with its opposite free strand to approximate the lateral bundles or cardinal ligaments.

to the opposite stable line, or lateral limit of the vagina, and also to approximate the cut edges of the mucosa.

One strand of each chromic gut suture surrounding each so-called cardinal ligament is utilized as a running suture along the posterior cut surface of the vaginal vault to prevent hæmorrhage, which not infrequently occurs from this surface. The remaining strands are now tied to approximate the cut "cardinal ligament" tissues. These latter sutures are used again and made to penetrate the lower margin of the newly constructed anterior vaginal wall from within out and tied to the sutures passed through the poste-
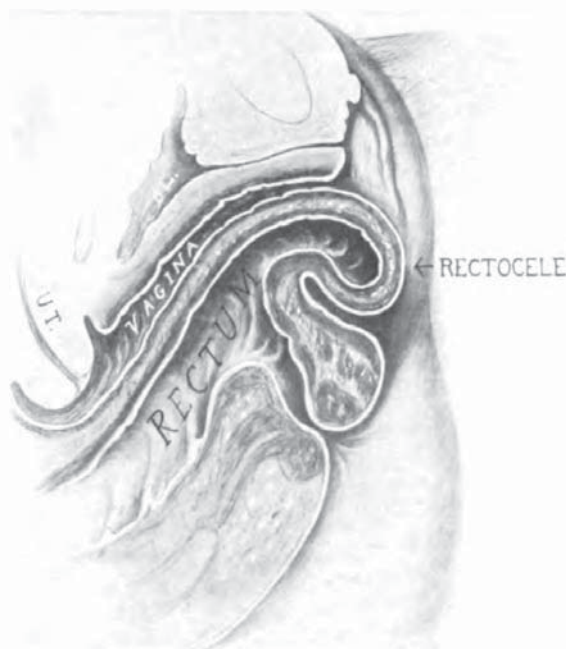
Fig. 3. A sagittal section showing a larger rectocele with cervix in normal position.

rior vaginal wall. Before tying these sets of sutures a narrow strip of iodoform gauze is passed into the posterior vaginal space. Iodoform packing in the vagina completes the operation.[1]

The features which I would particularly emphasize in this technique are (1), the separation of the cellular tissue at the beginning of the operation from the posterior surface of the cervix up to the peritoneal reflection without opening into Douglas' cul-de-sac. The great advantage of not entering the peritoneal cavity at the beginning of the operation is that the continuity of tissue here acts as a barrier to prevent the contents of the vagina from soiling the peritoneal cavity and the intestines from protruding into the vagina; it also prevents the cervix uteri from coming in contact with the peritoneum when the fundus is anteverted and the cervix is forced back into the vagina.

The second feature pertains to the removal of the corpus, which is delivered through the anterior peritoneal opening and operated on at the vulva. Each step in its removal is

[1] Previous to operation a 10 per cent nitrate of silver solution is applied to the vaginal mucosa and the external os closed with a continuous catgut suture.

executed with greater ease and exactness by attacking the upper portion of the broad ligaments first and working downward than by attacking the tissues around the cervix first (corpus remaining in peritoneal cavity) and working upward.

The third feature is the reinforcement of the anterior vaginal wall by lapping the fascia and anchoring the cut margins to the stable areas of the vaginal canal and approximating the cut surfaces of the cardinal ligaments.

That prolapse of the uterus, as well as of the anterior vaginal wall, has been cured by varied surgical procedures is not to be questioned, but failures continue to occur and no method has yet established itself in the confidence of the majority of surgeons.

When success is attained by any of the methods *per vaginam* now in vogue, emphasis is placed upon some particular feature considered essential for success. When hysterectomy is done for the relief of procidentia we find emphasis laid upon the approximation of the cut edges of the round and broad ligaments in one method, the shortening of the uterosacral ligaments or the anchoring of the round ligaments in the vault of the vagina in another, the interposition of the approximated round and broad ligaments or of the resected corpus uteri in still others. In my opinion all these special features are given undue consideration, and success, when attained, is the result not of them but of a common element entering into all of them—namely, surgical adjustment of the pelvic fascia.

It is not my object to discuss the individual operations for the cure of procidentia uteri and cystocele, but it would seem fitting, because of its historic interest and the principle involved in the Emmet operation to do more than make passing mention of it.

Emmet utilized the principle of fascial support of the anterior and lateral vaginal walls with the intuition and skill of the consummate surgeon he was. He recognized that success depended "upon the unyielding line along the vaginal sulcus on each side where the walls are connected with the pelvic fascia"—and that this tissue, owing to its elasticity, can be stretched to a certain degree

but for all practical purposes the areas are fixed.[1] By Emmet's method two lateral fascial surfaces are united to a central fascial surface; in this way the fascial support of the uterus and bladder is reconstructed and we have here the first instance, on a limited scale, of fascial lapping of the anterior vaginal wall. In Emmet's hands success by this method was the rule. In the hands of others success seems to have been the exception. I would not refer to this operation, long since considered obsolete by many, were I not convinced that it possesses an essential feature of success. Grant Baldwin recognized this fact several years ago, and also the cause of failure in the original technique and modified it with such results as should demand our respectful consideration.

It would seem a justifiable conclusion, with the evidence at hand, that the underlying principle of success in operations for the cure of uterine and vaginal prolapse is the proper surgical adjustment of the pelvic fascia; but the fact remains that we have not yet developed a standard technique or one which can be applied, with such modifications as the necessity of the individual case demands, to meet all requirements.

When a prolapsed uterus has undergone such structural change as necessitates its removal, or when, after menopause, its removal is considered for one reason or another desirable, the vaginal hysterectomy technique as herein described, will prove, I believe, the method most adaptable and satisfactory. I recognize that it has not yet been put to the test of time, but as it is in principle identical to that upon which nature, under normal conditions, depends for support, confidence in its ultimate success would seem justified.

CERVIX AMPUTATED, CORPUS RETAINED, AND FASCIA LAPPED

When it is found advisable, in cases of procidentia uteri, to retain the uterine body but amputate the cervix, the following technique presents certain advantages:

The first stages of the technique are in part identical to the first stages of the vaginal

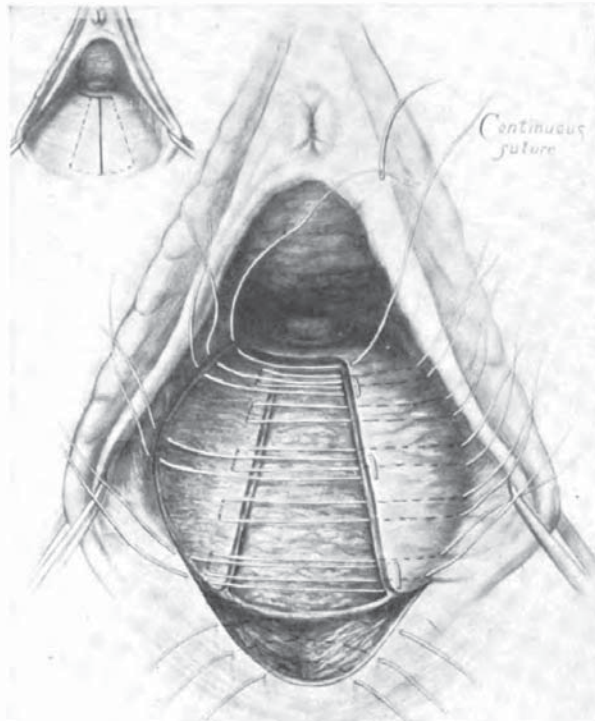[1] Emmet. Principles and Practice of Gynecology. p. 257.

Fig. 4. The dotted lines on the marginal insert indicate the approximate amount of tissue removed longitudinally from each posterior vaginal wall flap. The drawing is somewhat misleading as the amount of tissue removed is really more than would seem from the drawing. The tendency is to undercorrect by not removing enough tissue. The appearance after operation should be that of overcorrection.

The larger illustration shows the underlapping flap denuded of its mucous membrane; the line of fascia merging with the perineal body; the denuded perineal body and all sutures placed for anchoring flaps and closing perineum.

hysterectomy technique previously described, that is the vesicofascial area near the cervix may be entered by either the longitudinal or curved incisions. The line of cleavage is then followed laterally to the side walls of the vagina, longitudinally to the urethral region and along the cervix to the peritoneal area. As the separation of the bladder from the fascia progresses the anterior vaginal wall is incised in the median line up to the urethral region. The vaginal wall flaps are now trimmed longitudinally to the extent required and the flap to the left of the operator denuded of its mucous membrane. The sutures anchoring the flaps are placed in the manner described in the vaginal hysterectomy technique for
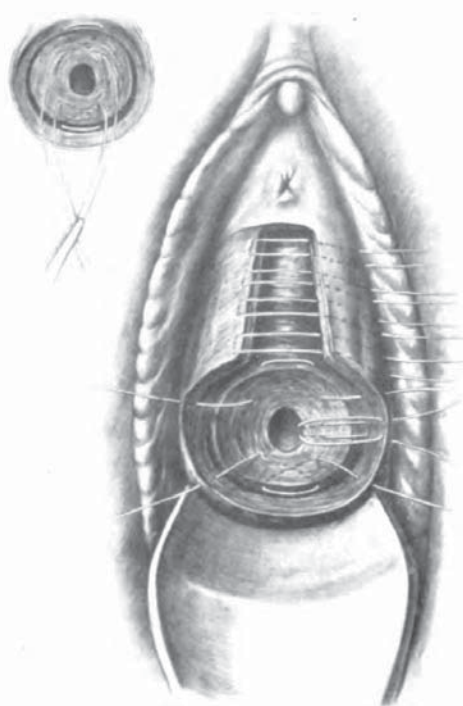
Fig. 5. This illustration shows the several stages of the operation for prolapse of the uterus where the corpus uteri is not removed, but where the cervix is amputated. The steps in the operation with respect to the anterior vaginal wall are practically identical to those where the corpus is removed. Immediately after amputating the cervix, two chromic gut sutures No. 2 are inserted in the cervical stump according to the manner shown in the insert. These sutures serve as tractors and control hæmorrhage during the progress of the operation. After anchoring the vaginal flaps the free ends of these sutures are passed through the vaginal tissues on each side and when tied anchor this vaginal tissue over the cervical stump. The middle suture in the main illustration is devised first to shift the position of the lateral tissue or cardinal ligament, and second to anchor the vaginal mucosa to the cervical stump. The method is reversed to that of Emmet and tends to lengthen rather than shorten the anterior vaginal wall.

procidentia uteri, namely, four or more mattress sutures being used to anchor the denuded or underlapping flap to the opposite stable line of the lateral wall of the vagina and four or more interrupted chromic gut sutures and a continuous suture to anchor the undenuded or overlapping flap to the opposite stable line of the lateral wall of the vagina.

Previous to tying the sutures of the anterior vaginal wall the mucosa about the cervix is stripped back laterally and posteriorly sufficiently to permit of a high amputation

of the cervix. The sutures of the cervix are placed according to a plan which is here particularly adaptable and serviceable. One figure-of-8 suture is inserted through the upper area of the cut surface of the cervical stump and one through the lower area. These two sutures may be placed immediately after the amputation of the cervix and used as tractors controlling hæmorrhage at the same time. At the completion of the operation their free ends are passed through the edges of the freed vaginal mucosa and when tied they approximate the mucosa over the stump. The sutures which direct and secure the vaginal mucosa to the cervical canal are inserted in an opposite direction to the classical method of Emmet. The needle is first inserted into the more or less free lateral tissue or cardinal ligaments on each side. The free ends of each of these sutures are passed through the cervical stump near the canal and back through the margin of the freed vaginal mucosa of the same side. By this form of stitching two objects are attained, namely: the cardinal ligaments are anchored to the cut surface of the cervical stump and the vaginal mucosa is anchored to the cervical canal. Extra sutures may be inserted, if necessary, and finally a narrow strip of iodoform gauze is passed through the cervical canal into the cavity of the uterus to prevent a possible union of the cut edges of the mucosa in the region of the cervical canal. Perineorrhaphy is done, if required, and the vaginal canal is packed moderately tight with iodoform gauze. By the Emmet technique the tissues of the vesical area are used to cover the anterior surface of the cervical stump, and to that extent the anterior wall is shortened. If his method is reversed according to the plan just described the length of the anterior wall is not shortened.

When in the childbearing period prolapse of the uterus and bladder is corrected by fascial lapping and the uterus retained it is as yet an open question whether or not the reconstructed fascial wall would prevent or in any way interfere with the process of labor. I have not as yet operated for procidentia uteri or cystocele by the fascial lapping method and preserved the entire uterus.

Fig. 6. This illustration shows a partial rectocele with deep vaginal sulci and a complete laceration of the sphincter. The black line indicates the first incision made in performing the Ristine operation. The repair of the sphincter and correction of the rectocele were done at the same time.
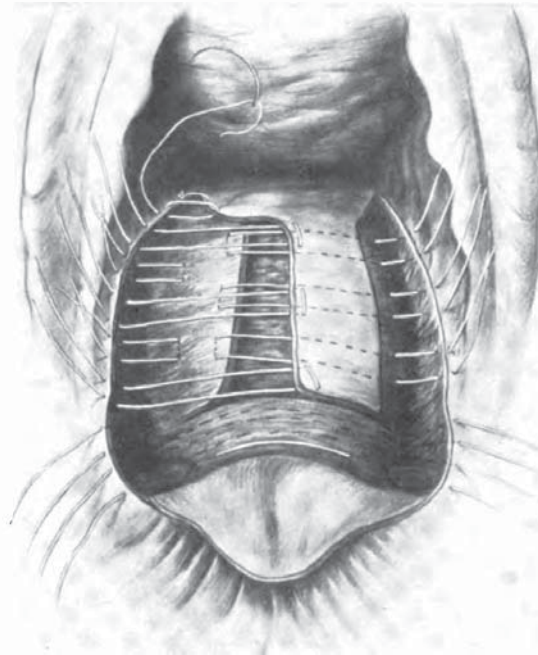
Fig. 7. In this instance we had two deep sulci to care for. The posterior vaginal flaps were prepared in the way previously described, except that the flap to the right of the operator was not trimmed longitudinally, and that portion of it which extended down in the sulci was denuded of its mucosa as was its corresponding lateral vaginal wall. The sutures were then placed in the manner shown in the drawings. When these sutures were tied, the flaps were anchored in such a way as to obliterate the sulci and elevate the posterior vaginal wall.

The Emmet-Baldwin operation does not permit of the completion of labor without the destruction of the operative results.

With complete procidentia uteri both the anterior and posterior vaginal walls prolapse in greater part; while this is the rule, cases do occur where one wall protrudes from the vulva more than the other, so that in one case we may have a marked cystocele, with the posterior wall but little affected, and in the other case a marked rectocele with but little protrusion of the anterior wall. Protrusion of one or another vaginal wall accompanying procidentia uteri does not, however, necessarily constitute rectocele or cystocele, but such a situation indicates a more or less damaged structural condition of the walls and demands surgical repair.

True cystocele is a more common accompaniment of procidentia uteri than rectocele. Either may exist independent of procidentia, but if associated with procidentia they precede and do not follow. A cystocele therefore may exist with the cervix in normal position, likewise a rectocele may exist with the cervix in normal position. The case of Mrs. D., which I reported in my last communication on this subject, was a striking example of the first type, and the first case of rectocele to be here reported, a description of which constitutes the basis of my work on fascial lapping for the cure of rectocele, is an example of the second type.

FASCIAL LAPPING FOR RECTOCELE

The mucous membrane of the perineum is first removed and the rectovaginal fascia exposed. This fascia is incised at about where it merges with the perineum or its remaining structures. On incising the fascia a cellular area is entered, which area constitutes the line of demarcation between the rectum and the vagina. The cellular tissue encountered is now separated from the under

surface of the fascia, laterally to the borders of the levator ani and longitudinally to the region of the cervix. As the freeing of the tissue from the fascia is continued in the direction of the cervix a median longitudinal incision is made and extended as far as necessary.

The vaginal flaps are now prepared for lapping by first trimming them longitudinally to an apparently excessive degree. The extent of this trimming depends on the amount of redundant tissue or size of rectocele. Roughly speaking only about half of each flap remains and the effect produced after completing the operation is that of over-correction.

The flap to the left of the operator is now carefully denuded of its mucous membrane. Scissors are used to make the denudation, as by careful use of them a thin submucous layer of tissue is left upon the fascia, which serves to maintain the fascial continuity of the flap. The flap thus remaining is relatively thick and resists the strain of the sutures better than the fascia alone would do.

The denuded flap is now severed crosswise at its highest point to the extent of about 1 centimeter in order to make a better fascial approximation when the flaps are lapped.

Four or more mattress sutures of chromic gut No. 2 are now used to anchor the denuded or underlapping flap to the opposite unyielding line where the fascia meets the lateral limits of the vagina. Four or more interrupted chromic gut sutures and a continuous suture are used to anchor the undenuded or overlapping flap to the opposite unyielding line along the side wall of the vagina.

When the rectovaginal flaps are anchored the perineal sutures are tied.

With rectocele, as with cystocele, we have a damaged condition in part or in whole of the fascial support. When this damage is not extensive and is limited to the perineal area, surgical approximation of the perineal portions of the levator ani muscles constitutes a sufficient barrier, but when an extensive rectocele exists, such as involves the entire posterior wall, or when the fascia has been torn away from each lateral wall, as in the second case to be cited, fascial lapping to the extent of the rectocele can alone be depended upon.

A rectocele may have associated with it taxing complications and the operative technique used must be modified accordingly as illustrated in the following case: Laceration of the perineal body through the sphincter ani, extensive lateral tears of the posterior vaginal wall, forming a sulcus on each side 4 centimeters or more in length and 2 centimeters in depth. The rectovaginal fascia was here torn away from the lateral walls and the posterior or rectovaginal wall bulged out like a tumor protruding from the vulva.

A crescentic incision was first made over the torn perineal area according to Ristine and the flap of tissue dissected down to the rectum and the skin border. The protruding pouch was next incised immediately above the crescentic incision and the rectovaginal cellular area entered. The line of cleavage from this point was followed laterally to the side walls and longitudinally beyond the limits of the pouch. A longitudinal incision was now made in the middle of the posterior wall, extending half its length. The flaps were trimmed longitudinally and the mucosa was completely removed from the sulcus and the flap to the left of the operator. The mucosa of the sulcus to the right of the operator was also removed, but the mucosa of the vaginal flap from this side was not removed. Several mattress sutures were inserted which when tied approximated the denuded surfaces of the sulcus to the right and anchored the denuded flap to the stable line, where the fascia normally meets the lateral limits of the vagina. The free margin of the undenuded flap was anchored to the opposite stable line along the side wall of the vagina. The mucous membrane edges were united, with a continuous catgut suture. Two plain catgut sutures No. O penetrated each free end of the sphincter ani muscle to approximate and accurately adjust these separated ends. Silver wire sutures were placed in the perineum in the usual manner, one penetrating the free ends of the muscle. The results of this operation were not only a complete restoration of the sphincter and the perineal body, but a correction of the

rectocele and an elevation of the entire posterior vaginal wall to practically its normal position. Hysterectomy had previously been performed for procidentia according to the method herein described, a report of which operation will be found in the *New York Journal of Obstetrics*, June, 1917.

It was found necessary in the first case of rectocele here reported to keep a depressor in the space created by the separation of the rectum from the vagina in order to prevent the fat deposited in the cellular tissue from interfering with the proper adjustment and anchorage of the denuded flap when the sutures were tied.

Fascial lapping meets its ideal application in extensive rectocele and cystocele. When applying this principle to these conditions the several fascial areas which have been given special names have as such no particular value. When cystocele is present a greater portion of the bladder is enveloped by the overstretched anterior vaginal fascia than normally exists. The same is true of the rectum when rectocele exists and the surgical problem here presented is to restore the normal relationship of the viscera and fascia, and reinforce the supporting structure so as to form an effective barrier and support.

The most satisfactory approach to the line of cleavage between the bladder and the fascia is at the angle formed by the cervix and the anterior vaginal wall. As the incisions sweep around the cervix from above, they should be made to cut through both the mucosa and the fascia. The line of cleavage entered here is followed laterally to the limit of the vagina and then longitudinally to the region of the urethra. The longitudinal incision of the anterior wall is started in the median line below and continued upward as the bladder is separated from the under surface of the fascia.

When the vesicofascial line of cleavage is sought entirely through a longitudinal incision of the anterior vaginal wall it not infrequently happens that the line of cleavage between the mucosa and the fascia is mistaken for the line of cleavage between the fascia and the bladder, and as a result, the fascia is considerably injured in the effort to define and free the bladder. One of the great advantages of the fascial lapping technique here described, whether dealing with a cystocele or rectocele, is that the finding and following of only one line of fascial cleavage is necessary. When this line of cleavage only is followed a minimum amount of bleeding results, but when both lines of fascial cleavage are followed a maximum amount of bleeding occurs, which under certain conditions may terminate seriously. Another important advantage in thus utilizing the fascia, without disturbing its continuity, is that a minimum amount of disturbance in its circulation is occasioned, and when the flaps are anchored the circulation in them remains practically unimpaired.

Too much emphasis cannot be laid on the desirability of trimming the vaginal flaps to apparently an excessive degree. Failure will occur if the effect produced after the completion of the operation is not that of overcorrection.