

GENITAL PROLAPSE: ITS OPERATIVE CORRECTION
BASED ON A NEW STUDY OF CLEAVAGE LINES
AND SLIDING SEGMENTS.*

BY

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(With fifteen illustrations.)

RECURRENCE OF CYSTOCELE AFTER OPERATION.

I class as recurrent any noticeable droop of bladder-wall, even though a small cy-tocele with few symptoms was found as the only defect left after an extensive operation for complete extrusion of the bladder. Among those who returned at a late date for examination there was found one recurrence in every ten cases. It seemed fair to presume that this may have also been the proportion among those who did not return. Therefore I guess at the frequency of this partial recurrence as one in every five operations. In a particular group specified later the proportion was larger. Such results, if general, call for an overhauling of our methods of operation.

In reviewing cases recurrent after my own operating, I found ten so fully noted and measured, and traced by lead tape or solder wire before and after operation, as to be especially adapted for study, and concerning these I reach the following conclusions:

The choice of operation had little to do with the recurrence. It followed anterior colporrhaphy with perineorrhaphy, three cases; fixation of stripped and lifted bladder to uterus, which was then fixed or suspended, two cases; interposition of Watkins, one case; vaginal hysterectomy with fixation to broad and round ligaments (Goffe) one case; and ventral fixation of bladder to abdominal wall, three cases; in every case operations on the pelvic floor and anterior vaginal wall having been fully carried out.

Age had little bearing on recurrence. The ages were twenty-nine, thirty-six, thirty-seven, forty, forty-three, forty-five, forty-seven, forty-eight, sixty-four, seventy.

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Among overlapping causes which would help to extenuate relapses, there were noted, activity too soon, three cases; age forty-seven or over, four cases; fat abdomen, four cases; muscular flabbiness, four cases; tight clothing, six cases. One instance was due to severe and prolonged coughing. The only conditions that could be called general were 1. *long duration*, time between injury and operation averaging ten years; 2. *local tissue defect*, chiefly atrophy and flabbiness, and 3. *strain*, patients being housewives, domestics, stage dancer, society dame. Back of all these causes lies our lack of anatomical knowledge, and its consequence, somewhat haphazard operative correction.

If such results are general, then we must urge early routine examination of the pelvic floor before hopeless tissue changes occur, say two years after every labor, with care to emphasize a defect, if present, by asking the patient to strain down hard, or let her stand, with corsets tight, while one examines. After operation we must undertake long watchfulness in such matters as dress and strain. Lastly, the surgeon should be guarded in his promises, saying that, for perfect results, in bad cases, a second but smaller operation *may* be needed, and in women whose general condition is one of utterly relaxed tissues success or relief should not be promised unconditionally.

Of symptoms not relieved I place first the bearing-down discomforts. When partial recurrence occurs this symptom remains. The failure to relieve irritability of the bladder I think largely due to omission to treat the trigonitis left over, and this item must constitute part of the after-care of every cystocele patient. Varicosity of bladder-base as a cause of continued irritability remained in those whose droop returned. Incontinence is a matter calling for separate study, and can hardly be taken up here.

As to the reasons for defective diagnosis or incomplete operation, certain new anatomical considerations are here urged, based upon a hundred private operative cases in which full notes were recorded, and upon the available frozen sections.

CLEAVAGE LINES AND SLID SEGMENTS.

Even after long study the downward displacements of the pelvic organs have seemed protean, baffling, confusing. There has been proposed no grouping which is anatomically simple and clinically useful. Such an understanding and classification was impossible until the publication of a large number of sec-

tions of prolapses, each accompanied by a detailed description. In the thirty-three cases of the remarkable series of the Halban-Tandler book (*Genital Prolaps beim Weibe*, Braumüller, Wien, 1907) this material is at hand, and I am able to offer a solution of the anatomical muddle, built on clearer ideas, which, altering our point of view in operating, gives us cause to hope for better results.

The Viennese authors classify their cases under two causes—downward thrust in the anterior peritoneal pouch (Fig. 2), the vesicouterine, or in the posterior pouch, the uterovaginal (Fig. 14). Then they form for cases of “descensus uteri” and “rektokele”—two separate and unrelated groups. This explanation offers no practical help to the man at the operating table.

The grouping now first proposed fits almost every section in the book, as well as my own lead tape and solder wire tracings. The proposition is as follows: There *are in the pelvic diaphragm four lines of cleavage* (Fig. 1). They are not the well-known “faults in the strata” of Hart and Barbour—urethral canal, vaginal canal, rectoanal canal. In labor it is unquestionable that the vaginal slit is the cleavage plane whereby the pelvic floor divides into an anterior pubic segment that is pulled upward and a posterior sacral segment that is thrust downward. But in the landslides caused by labor and the slow landslips that happen later, segments come into action that are not the “pubic” and “sacral,” and these two terms, which have to do with the physiology of labor, become a hindrance when considering the pathology of labor and the mechanics of prolapse.

The *four cleavage planes* of pelvic floor prolapses run as follows:

1. Postpubic, close to the bone.
2. In the urethro-vaginal septum, close behind the urethra.
3. In the rectovaginal septum, just behind the vagina.
4. Along the ano-rectal canal.

Consequently there are *four prolapse segments* in the pelvic floor:

- a. The urethral segment.
- b. The vaginal segment (including trigone and cervix).
- c. The perineal segment.
- d. The retroanal segment.

The diagram (Fig. 1) is easier to understand than the following specifications:

The urethral segment includes the whole urethra, the anterior (postpubic) bladder-wall and the postpubic triangle, and is held in place by the triangular ligament and pubovesical ligament.

The vaginal segment includes the vagina and most of the urethrovaginal septum and the bladder-base, the cervix and the posterior vaginal wall, and is attached laterally to the base of the broad ligaments, behind to the uterosacral ligaments, and has no levator fibers upholding it by running into it.

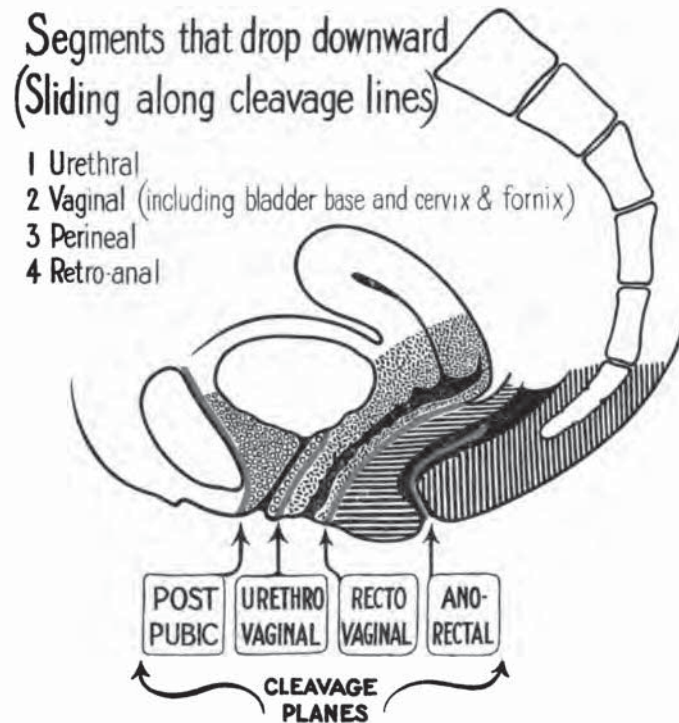


FIG. 1.—The lines of cleavage in the pelvic diaphragm that group prolapse cases anatomically and clinically, and determine choice of operation. The vaginal segment slides most frequently, and very commonly leaves the perineal and retro-anal segments in place.

The perineal segment includes all the perineal pyramid and recto-vaginal septum except the posterior vaginal wall, and does get levator fibers.

The retroanal segment includes the Hinterdamm and the coccyx and is upheld by the levator and pubococcygeus (Fig. 7).

Laterally, the cleavage lines are fully as important, but well recognized. The steep slopes of the levator fascia and the strong crosswise span of the triangular ligament must be searched for on the operating-table, and lateral support obtained, or our work fails.

This clinical explanation saves us a lot of remembering of concepts of fascial layers and minutiae of attachments most confusing to keep clearly in mind and most of them unfindable in operations. However learnedly we may talk of dissecting-room details, in the operating-room we work in masses and layers,

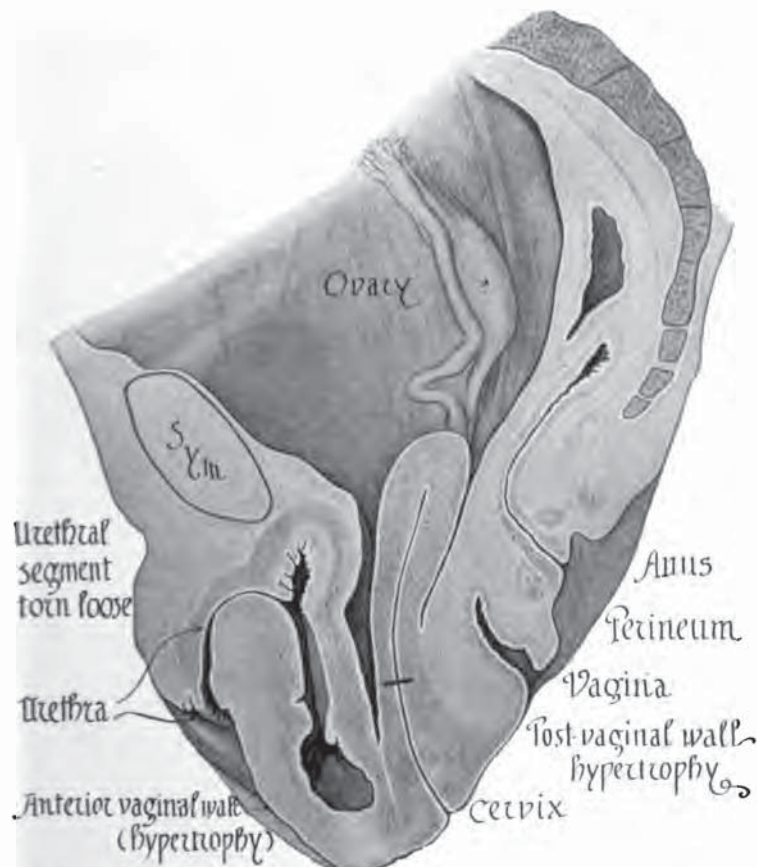


FIG. 2.—The urethral segment badly dislocated. The internal orifice and the anterior bladder-wall are far from their retropubic base, and need reanchoring there. (Halban & Tandler.)

and not in muscle-fiber films nor in paper-thin edges, and all these procidentias exhibit atrophies of extreme degree.

At the risk of prolixity, for the sake of completeness, we may go into the diagnosis of a landslip of each of these segments, their degrees, their relations to the other three segments, and the treatment of the prolapse of each.

1. If the urethral segment slides (Fig. 2), the diagnosis of the urethrocele is made with the glass catheter by studying the relation the canal (and the anterior wall of the partly filled bladder) pressed down by straining bears to the rear of the pubic bone and subpubic ligament. The location of the inner opening of the



FIG. 3.—The vaginal segment slides (vagina-bladder-base-cervix) leaving the other three in place. Plastics and a round ligament operation or ventral fixation would suffice, and the long, edematous corpus would shrink after operation. (H. and T.)

urethra is, practically, the whole thing. The urethral segment is frequently left standing in place in bad cases of prolapse (Fig. 15). A concavity downward in the course of the urethra may be of itself of little more moment than the condition it resembles—large anterior columns of the vagina. The whole urethral segment never slides far without that slip of the vaginal

segment which drags down the bladder-base. Restoration of the perineal segment rarely holds up a badly depressed urethral segment. In the worst cases of injury the urethral canal runs toward the coccyx, or, concavity upward, points downward toward the thigh (Fig. 12). In such cases, particularly when the whole canal is displaced bodily downward (Figs. 2, 11, 12),



FIG. 4.—Intravaginal cystocele, with the first degree of outward slip of the vaginal walls, the cervix following. The anterior bladder-wall and urethra are in place and the two rear segments and levator intact. (H. and T.)

the anterior (post-pubic) bladder-wall must be sutured to the lower abdominal wall. One of the common causes of failure, heretofore, in completely curing bladder prolapse, has been ignorance concerning this segment, its independence, and the place where it needs to be made fast. My own experience in anchoring it has been limited to a few cases. In the 33 Vienna sections the urethral segment is found to be markedly displaced in fifteen

cases; it goes with the neighboring segments, the vaginal, in these fifteen cases.

2. The vaginal segment slides more often than any other in the procidentias of considerable bulk, as it is made up of the bladder-base and cervix, as well as the greater part of the urethro-vaginal septum (Fig. 3). The bladder goes with the uterus, but may leave the anterior vesical wall and urethra in place. It should



FIG. 5.—The perineal segment has dropped with the vaginal owing to injury to the anterior part of the levator and its fascia and to the attachment of the anal sphincter. (H. and T.)

be noted that in genital prolapse nearly all the stress has been laid upon the womb hernia. As a matter of fact the bladder hernia is, of the two, the more important clinically, and surgically by far the most difficult to hold up.

The degrees of prolapse of the vaginal segment are conveniently named:

a. Intravaginal cystocele, not protruding beyond the hymen under strain, with or without descent of cervix, which may be

either hypertrophied, anteflexed, or part of a retroversion. (See Fig. 4.)

b. Extravaginal cystocele, protruding beyond the hymen on straining, with or without protrusion of the cervix. (See Fig. 5.)

c. Complete extrusion of bladder and uterus, one or both, beyond the plane of the outlet of the pelvis. (Fig. 2.)

3. The perineal segment is displaced more often than any other

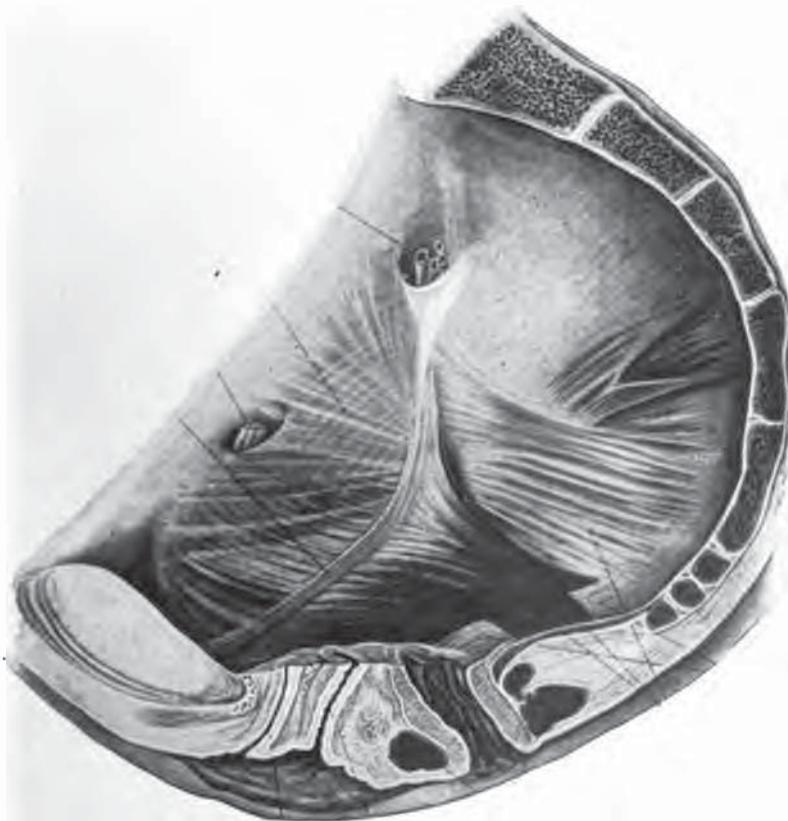


FIG. 6.—Section of normal pelvic floor with good fascia and well-developed levator and transverse supports. (H. and T.)

among dislocations of the lesser degrees, because the commonest injuries the pelvic floor suffers are those inflicted by the two battering rams, the fetal column and the fecal column. The larger body tears structures and weakens the anterior rectal wall; the smaller wears it out by worrying at it.

One variety of rectocele is not easy to correct and prone to recur, and that is the forward protrusion originating high on

the rectovaginal septum. This I have considered in a separate paper. (High Rectocele after Perineal Repair, AMER. JOUR. OBST., vol. lvii, No. 3, 1908.)

4. The retroanal segment is not often the subject of prolapse in a marked degree (Figs. 12 and 14), and this is fortunate, as the extreme down-dropping of this segment is very difficult of relief

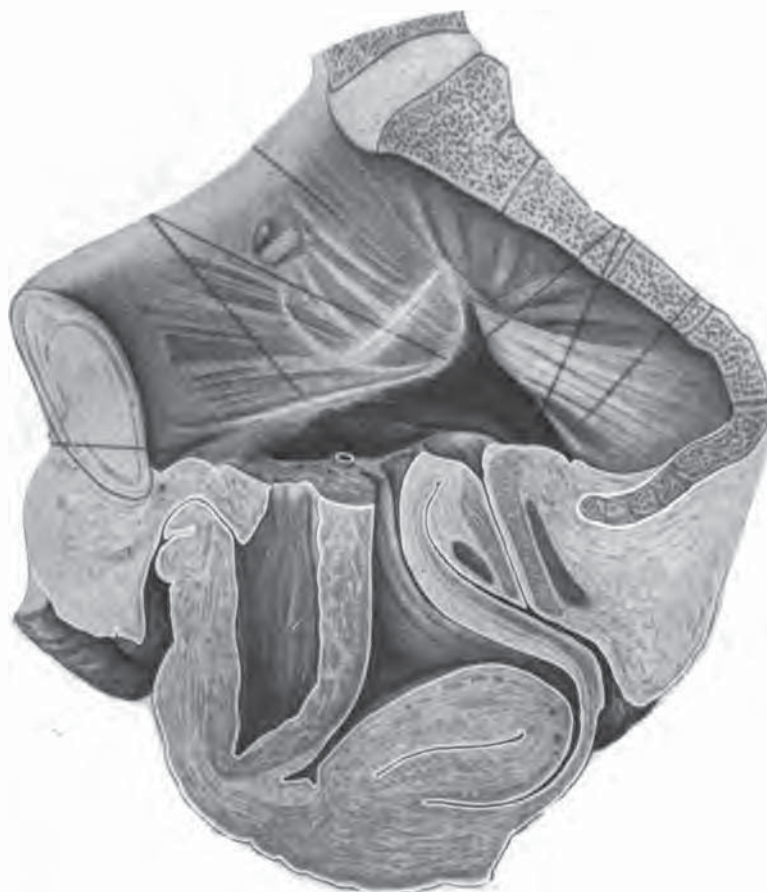


FIG. 7.—Prolapse of the uterus and bladder in the presence of a levator notably strong and one which holds the sacral and perineal segments aggressively. (H. and T.)

if it means a hopeless atrophy of levator and fascia. In the worst atrophies the pelvic floor may have to be built out of buttock flaps slid inward.

The radical novelty of the disconcerting dissections in the Talban-Handel book is absence of sag of the Hinterdamm in the

presence of complete extrusion of bladder and uterus (Figs. 7, 8, 9). Bracketed with such procidentia one finds in these plates and notes many levators well developed and some strong and thick and active (Figs. 7, 8, 9). Our faith in the trusted muscle and its fascia seems blasted. But if the function of the levator is

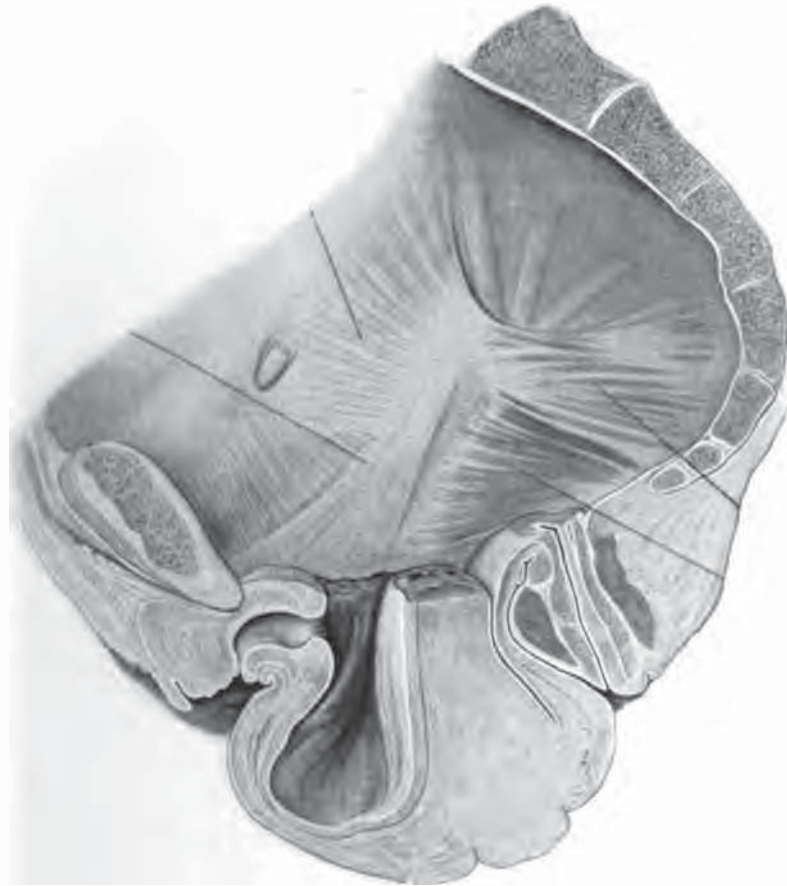
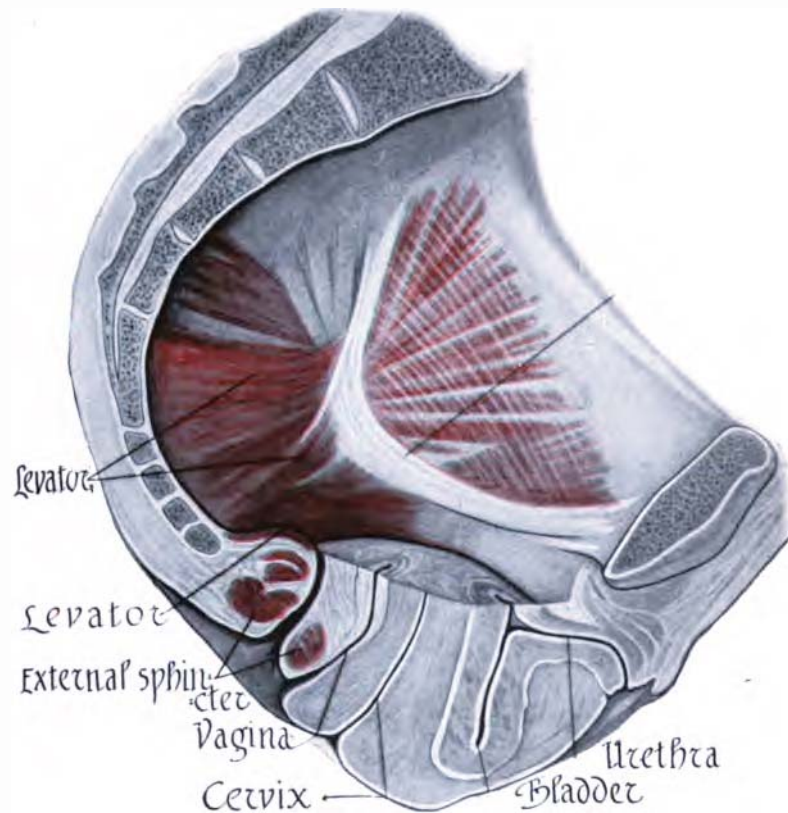


FIG. 8.—Incomplete prolapse with good levator and well lifted "sacral segment of Hart." The urethral segment is away from its anchorage. (H. and T.)

entirely to uphold the retroanal segment and partly to sustain the perineal segment, and if it is responsible for these duties alone, the bottom does not drop out from our faith, or the patients', without reason. We see that even in the presence of a levator spasm and hypertrophy sufficient to drag anus close to pubic arch after bad perineal damage such tension cannot hold back

the insinuating water wedge or the interpolating cervix when the anterior anchorages are actually torn away.

Any combination of the four segments may drop downward (Figs. 10-13). A few of the worst cases involve all. It is to be



Prolapse of uterus and bladder though levator is strong and sound. Perineal & sacral segments in place.

FIG. 9.—A large prolapse with a levator shown by dissection and action to be well developed. (H. and T.)

noted, however, that the second, or vaginovesicouterine, is the one commonly involved, and with it, not infrequently, the urethral.

To the typical dislocation downward of any segment there is added, in certain cases, a deformity due to edema and hyper-

trophy, as of the anterior vaginal wall or cervix (Figs. 7-9). I formerly supposed that the bladder slid off the cervix, but I can find few instances of this. That the vesicouterine pouch may



FIG. 10.—Prolapse of all four segments with evident need of ventral fixation of the bladder. (H. and T.)

become the hernial sac of an enterocele boring its way out beyond the vulva has been noted (Fig. 2). It is much rarer than the hernia of the uterorectal pouch (of Douglas) which occurs at times when the sacral segment sags (Fig 14).

SURGERY OF THE SEGMENTS.

Surgical correction of the lesser and greater degrees of the chief hernia (the vaginovesicouterine) is less satisfactory than



FIG. 11—Prolapse of all four segments. (H. and T.)

restoration of the other segments, chiefly because the bladder-base cannot be conveniently or surely fastened back into place by

hitching it to any supports it was intended to hang on. We can raise and swing the uterus by its guy ropes, or anchor it, or lay it to span the gap from urethral to retroanal segment, or remove it. To deal with it is not difficult, for it is a solid

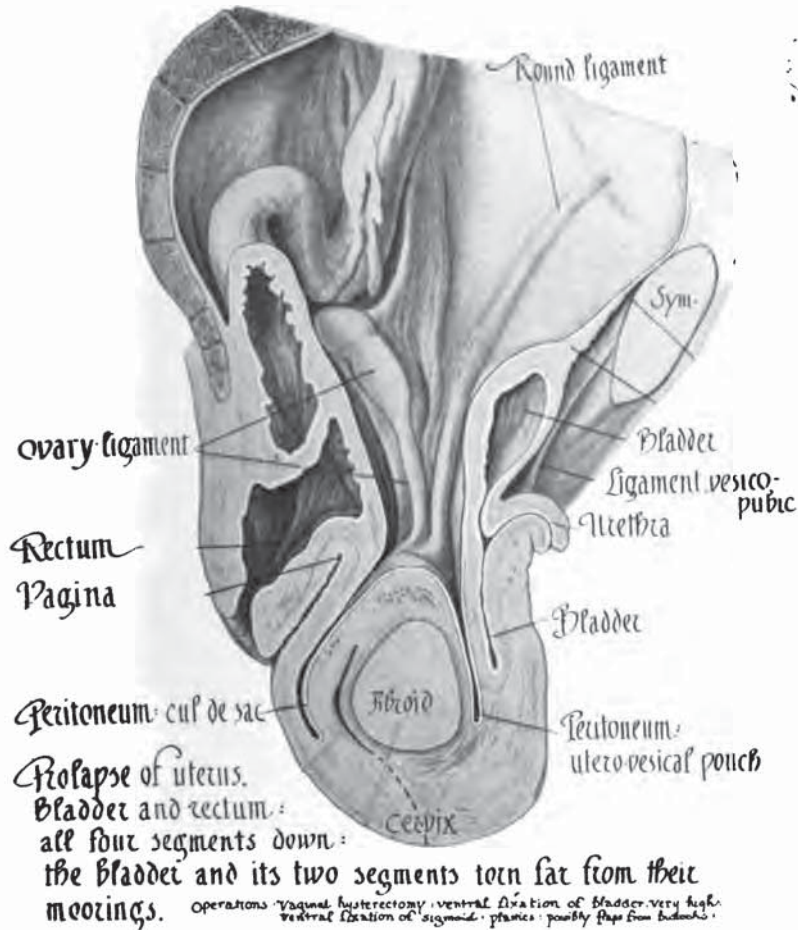


FIG. 12.—All four segments very low, the bladder dragged far from its moorings and demanding ventral fixation after the vaginal hysterectomy. The retroanal segment requires a sigmoid or rectal fixation. (H. and T.)

organ, and, moreover, often out of commission. But the shifting water-bag is elastic, hung over an opening, jounced when full, and often over-full, and is pressed down by whalebone springs. To rebuild lateral sloping shelves that will hold this bag is the baffling problem in pelvic plastics and only next in difficulty to

the repair of an ancient sphincter damage. To meet it a surgeon must have all expedients ready in order to select that which will suit each particular set of conditions.

1. In old women with bad bronchi, or hard arteries, a flat

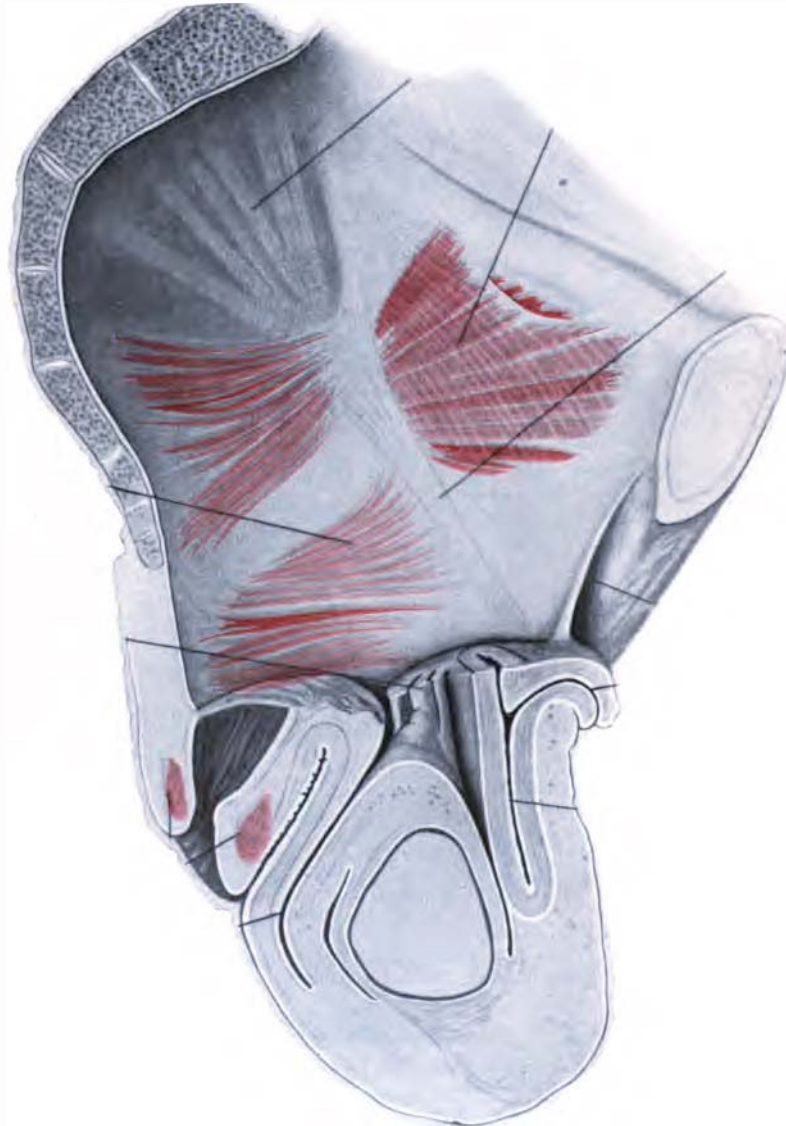


FIG. 13.—The atrophied, stretched levator of Fig. 12, and the long pubovesical ligament. (H. and T.)

pessary like the Schatz may span the levator gap if the levator has some hold on the retroanal segment. The Byrne pessary is also of use.

2. Anterior colporrhaphy suffices for uncomplicated intravaginal cystocele in young women and with recent injuries, if it is

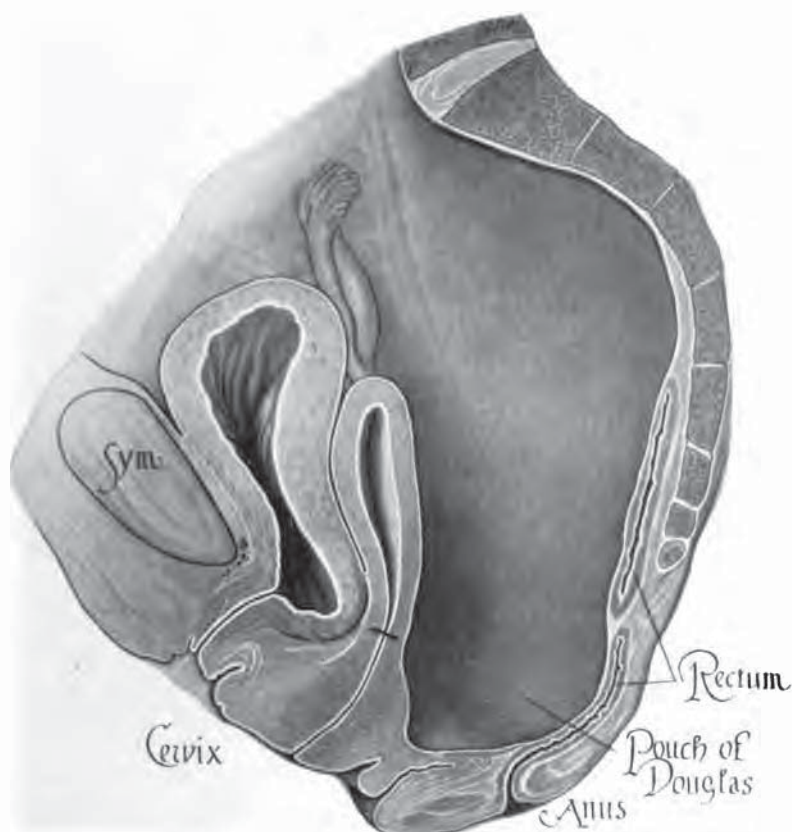


FIG. 14.—Example of the variety in prolapse. The anterior segment is exactly in place while the three rear segments sag. Ventral fixation of the uterus if the patient is old, or work to restore fascia and levator with fixation of sigmoid would relieve this condition. (H. and T.)

backed by a good perineal repair, but in the presence of pronounced atrophy or flabby make-up, the bladder would better be freed and slid up the uterus.

3. Fixation of bladder to uterus (vaginal fixation of uterus) fits a number of the intravaginal and extravulvar cystoceles, the bladder being slid up the uterus, but not fastened to the fundus unless the Fallopian tubes are tied off.

4. Interposition of the anteverted uterus between the bladder and the anterior vaginal wall (Watkins) has a field in old women or women who should be sterilized, possessed of small uteri, and exhibiting good urethral and sacral segments. The relapses have been due to neglect of the last specification.



FIG. 15.—All the segments drop low except the urethral, yet the pelvic floor has no evidence of injury in the median line. This is a case of marked relaxation of the levator with opening up of its fibers. (H. and T.)

5. Fixation of bladder to uterus, with ventral suspension or fixation of uterus. A bladder-base, if much elongated, is to be slid up on to the anterior uterine wall.

6. Ventral fixation of bladder (naked wall to naked rectus)

is necessitated where the urethral segment is torn loose and much depressed (Figs. 1, 7, 8, 9, 10, 11, 12); where the bladder is of great volume and extruded (Figs. 2, 3, 4, 10, 11); where no adequate pelvic floor can be built, and whenever ventral fixation of the uterus is called for. (Ventral Suspension and Ventral Fixation for Prolapse of the Bladder with the Uterus, *Brooklyn Medical Jour.*, June, 1903.)

7. Vaginal hysterectomy, with fixation of bladder to broad and round ligaments (Goffe). This will fail if the urethral segment has dropped far.

8. Fixation of sigmoid—in the deepest sacral segment prolapse with large culdesac hernia, it is required. (Figs. 11, 12, 14, 15.)

It is of the greatest importance in all these cases that the urethral segment, if protruded, be lifted and made fast, and neglect of this measure spells relapse. With all the foregoing, except perhaps the pessary, it goes without saying that the best possible perineal support must be built, even if, in the absence of pelvic floor structure, flaps have to be swung in from the buttocks, as I have done four times.

Summary.—From the point of view either of pathological anatomy or surgery the frozen sections show the importance of recognizing certain cleavage planes in the pelvic diaphragm, and intervening segments that slide. The cleavage runs 1. postpubic, close to the bones; 2. in the urethrovaginal septum; 3. in the rectovaginal septum, and 4. along the anorectal canal. If the urethral segment falls any considerable distance, only ventral fixation at the rear or top of the pubes will hold the upper urethra and anterior bladder-wall. The second segment (vagina, bladder-base, cervix) is the common hernial mass. A convenient nomenclature would be intravaginal cystocele; extravaginal cystocele, protruding beyond the hymen on straining, and complete extrusion, bladder, cervix, uterus, one or all. For the worst cases, the writer employs ventral fixation of the bladder, whether vaginal hysterectomy is done or not. The retroanal segment, when very badly prolapsed, particularly in the presence of protrusion of the uterorectal pouch, may call for sigmoid fixation, and the wide-open bony outlet of the pelvis may present no tissues out of which a diaphragm can be built so that flaps from the buttocks may be required.

168 CLINTON STREET.