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On Shortening of the Round Ligaments for Backward Displacement of the Uterus, based on a personal experience of Eighty-five Cases.

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I HAVE collected together the records of my cases of shortening of the round ligaments because I think the operation itself, which was first introduced by Dr. Alexander of Liverpool, is a very useful one, and because the method I have employed now for many years, of closing the external ring at the time of operation, increases its value.

Perhaps some history of my experience may be of interest. When I began operating nearly twenty years ago, I did not find it always easy to discover the ligaments, and this, combined with the very imperfect asepsis of the period, made suppuration and imperfect healing of the wounds a too common sequel.* In addition to this, such custom as had already formed, favoured the excision and removal of the excess of ligament which had been withdrawn; and the three or four inches of excised ligament from both sides formed the usual specimens which showed that the operation had been satisfactorily accomplished. This, again, led to a mistaken practice regarding the stump of the ligament: it was often used as a little plug at the lower part of the external ring, and sometimes the final suture closed the ring below it, forming an almost circular ligature around the ligament.

This technique was decidedly faulty. It tended to sloughing and suppuration, and though the final result was often good, in one or two cases hernia followed.

About this time, the alternative operations of vaginal fixation, ventral fixation, and ventral suspension of the uterus came slowly to

* Dr. Alexander himself wrote at this time: "The wounds rarely heal by first intention, owing to the strain on the stretched ligaments and the restlessness of the patient."

the front, and many were attracted by the ease, immediate certainty and simplicity of these methods. For a few years (although it always seemed to me that the shortening of the round ligament was the best operation for uncomplicated cases of backward displacement during the child-bearing period) I used these other means of retaining the uterus in position, and one method—that of ventral suspension—I still occasionally employ during the child-bearing period when it is necessary to open the abdomen for other reasons.* But I gradually found that there were possible dangers attending these operations which should not be incurred if as good a result or better could be obtained by the shortening of the ligaments.

First, there was some real danger of death. When acute sepsis does occur, it is quite as possible after a simple vaginal or ventral fixation as after a hysterectomy, and in one case of this kind in which the uterine sutures were followed by abscess and sloughing, it was only by a quick hysterectomy that I succeeded (I believe) in saving the life of the patient. Secondly, some of these methods were by no means permanent or trustworthy. In one case of vaginal fixation the uterus broke away from its adhesions in a few months, and I had to shorten the ligaments afterwards in order to secure the better result which remains to this day.

In other cases I know, either directly or indirectly, that suture of the uterus to the anterior abdominal wall has been followed by a persistent dragging pain or uneasiness, and the operation has finally resulted in the formation of an artificial ligamentary or muscular band some two or more inches long, which has not only allowed of a secondary retroflexion but has appeared to be a cause of recurrent flatulent dyspepsia by the occasional production of an intestinal "kink," and consequent interference with intestinal peristalsis. Finally, in many cases, all of these operations have interfered with the normal course of subsequent pregnancies. Vaginal fixation is the worst offender in this respect, but ventral fixation is nearly as bad. In one case I have known of sudden death caused, I believe, by rupture of the uterus; in another, Cæsarean section had to be done in order to deliver the child, and even after ventral suspension I know of a case of pregnancy followed by hæmorrhage in the earlier months and some obstruction or delay due to faulty position at the confinement.

So real is this danger of difficult labour afterwards that some operators, when they fix the uterus to the abdominal wall during the child-bearing period, are in the habit of removing or crushing the Fallopian tubes so as to sterilize the patients.

Dr. Lynch (*Johns Hopkins Hospital Bulletin*, 1904, vol. xv.) has collected twenty-one cases of Cæsarean section necessitated by com-

* Ventral fixation I keep entirely as an accessory to plastic operations for "protrusion" after the menopause.

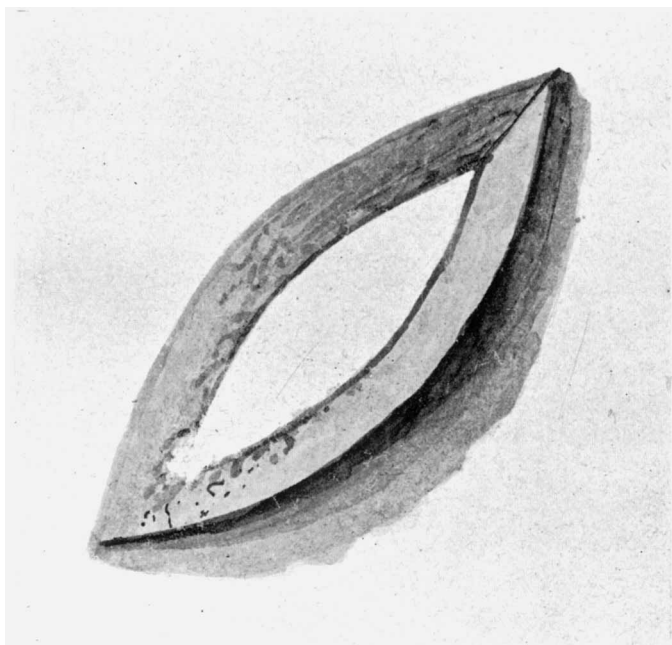


FIG. I.—Incision down to deep fascia covering aponeurosis. This is perfectly plain and rather yellowish from fat below it (between it and aponeurosis).

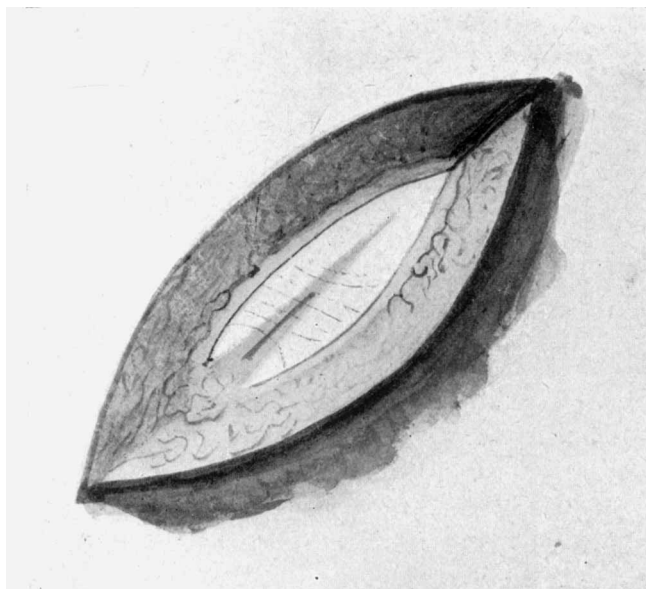


FIG. II.—Incision continued through fascia down to aponeurosis or tendon of External Oblique. This is very white, and generally shows a darker triangular portion or gap, the site of the inguinal canal. This is crossed by white fibres of the inter-columnar fascia. The site of the opening into the canal is shown by a dark line.

plications due to previous operations for retroflexion. In none of these had the operation been one of shortening of the round ligaments. Dr. Howard Kelly records (regarding his own operation of ventral suspension) that in seventeen cases of re-opening of the abdomen after this operation, the uterus was attached to the abdominal wall by a single dense, smooth, fibrous band, from 3 to 5 cm. in length, in 12 cases; in 4 cases he found two bands, and in one case three. He further records that "in 14 cases of labour following ventro-suspension, the patients were examined at varying periods afterwards, and while a good position for the uterus was maintained in 9 cases, in 5 cases the uterus was again in retroflexion" (*Operative Gynecology*, 1906, vol. ii., p. 150).

After some eight years (from 1891 to 1899) when I was trying some of these other operations, I returned to the operation of shortening the round ligaments, but with a different technique which I considered would obviate or prevent the little objections I had formerly found to its use. The operation I finally carried out, and have done now for the last eight or nine years, is as follows.

The patient, aseptically prepared, is placed in the lithotomy position, the vulva and vagina are sterilized, and a full examination is made of the uterus and appendages, under anæsthesia. The condition found should be one of uncomplicated backward displacement. If *any* intraperitoneal disease is found, especially any kind of adhesion, I regard it as an indication against operation by this method, abdominal or vaginal section being preferable. Some prolapse of one or both ovaries, even with a little enlargement, is, however, no contra-indication, some of the most happy results being obtained in cases of backward displacement with this as an additional feature. The uterus, which is generally slightly enlarged and the subject of some chronic endometritis, is dilated and well curetted, and placed in complete anteversion, with a well-fitting pessary to support it in the normal position.

The patient is then laid on her back and the site of the further operations well sterilized. I usually stand on the same side of the patient as that on which I operate, and begin on the right side. The main description accordingly will be for the operation of this side.

The spine of the pubes is felt for by the tip of the left forefinger, the side of which should also feel the resisting line of Poupart's ligament. With these as landmarks, a very small incision of about one inch in length, with the spine of the pubes at its lower point, is made just above and parallel to Poupart's ligament down to the deeper layer of superficial fascia which here is always strongly marked. (Fig. I.) This is then divided in the same direction, exposing the tendon of the external oblique, the intercolumnar fascia

and the so-called pillars of the ring. (Fig. II.) The anatomy of this region varies very much in different patients, and a good view must be obtained by cleaning the tendon carefully and holding the sides of the incision open if necessary by hooks or small retractors. Quite an extended view may be obtained through a very limited incision as the incised parts admit of considerable gliding movement. Sometimes the definite triangle of thin tissue between the two pillars is well marked, sometimes it is excessive, sometimes wanting, and sometimes a gap is found in the tendon to one side of this. Then Poupart's ligament and the spine of the pubes are the best guides to the position of the inguinal canal. A little incision is made over the middle of the canal, and the sides of the incision may be held apart with hooks. Two strabismus hooks are convenient for this purpose. As a rule a small nerve is seen lying directly under the incision. Interference with this should be avoided during all the subsequent stages of the operation, or the nerve may be divided. The whole contents of the canal excepting the nerve are now lightly grasped by a pair of dissecting forceps in the left hand and held upwards and inwards (towards the middle line) while the lower and under side of the tissues is searched for the round ligament. (Fig. III.) It has a rather pearly appearance when covered by fascia, and must be recognized at this stage, as it is "in situ," rather than by any process of tearing and separation which may destroy its appearance and consistence. When seen, it is seized by another pair of dissecting forceps held in the opposite hand, the rest of the canal contents is dropped, and some traction made on the ligament, which throws it into relief or prominence. If its upper part now is clearly seen, the fascial attachments are separated by the forceps held in the left hand, and the white ligament ("white" while traction is being made upon it) is pulled out of its bed. Some three or four inches of the ligament are pulled out, at first by the use of alternate forceps, and afterwards by the fingers, until one sees the fold of peritoneum near its uterine attachment (forming the canal of Nuck) and recognizes that the ligament has come as far as it will. (Fig. IV.)

Then a sterilized swab is slipped underneath it, covering both it and the incision, and changing places with his assistant, the operator carries out the same steps on the other (or left) side of the patient.

The sewing of the ligament, closing of the ring, and completion of the operation (on both sides) I do as follows:—

A small curved needle is threaded with the finest "ophthalmic" silk (3 or 4 noughts) which has been sterilized by boiling in red iodide solution, and the suture is begun by taking up the pillars of the ring at their highest point and tying them together so as to obliterate the weak space here. Then a continuous suture is carried down, taking up the pillar of the one side, the upper part of the round ligament with some of the canal of Nuck, and the pillar of the other

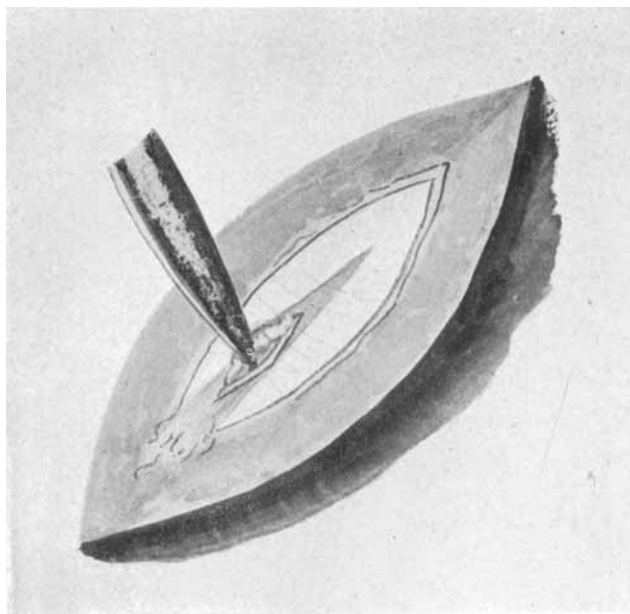


FIG. III.—The whole of the canal-contents are grasped by dissecting forceps and held upwards and inwards (toward the middle line). Indication of the round ligament is found “undermost and lowest.”

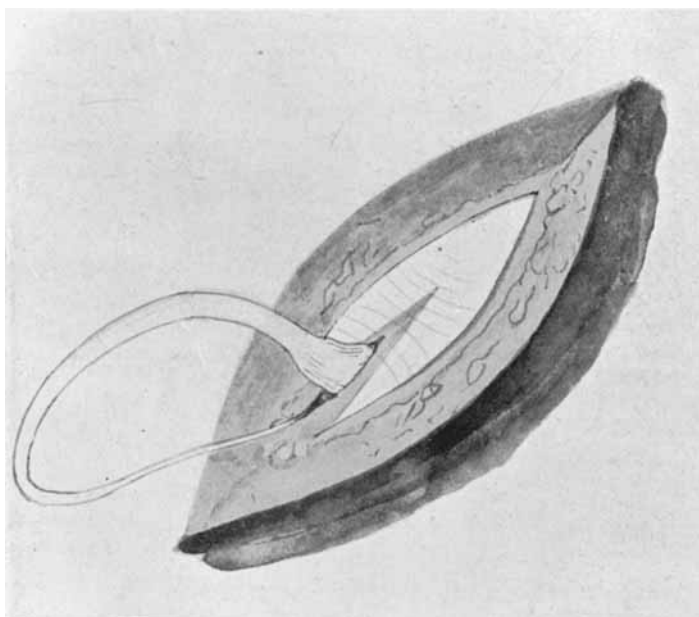


FIG. IV.—The round ligament pulled out as far as it will go. The sheath of peritoneum forming the “canal of Nuck” is seen attached to its uterine end.

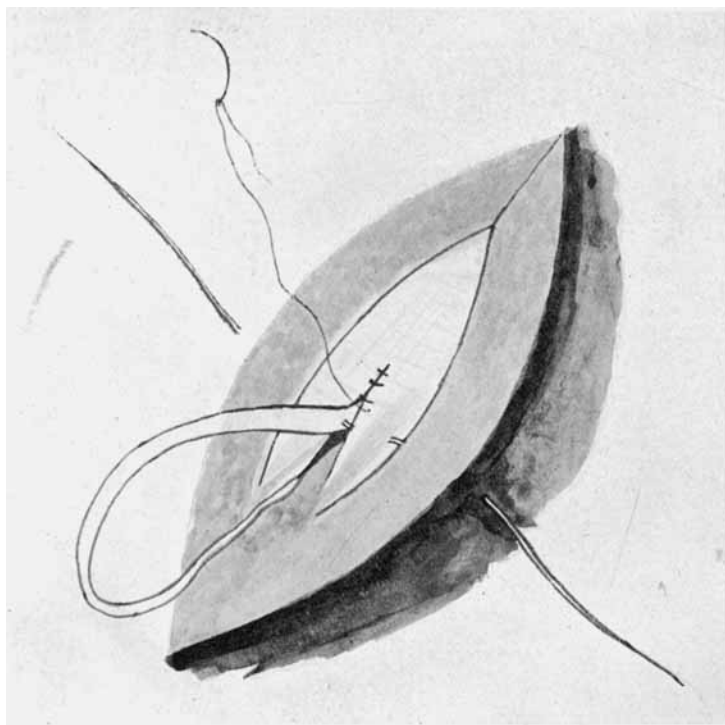


FIG. V.—The beginning of the fine suture of the pillars of the ring and round ligament, and the passing of the “stay” suture.

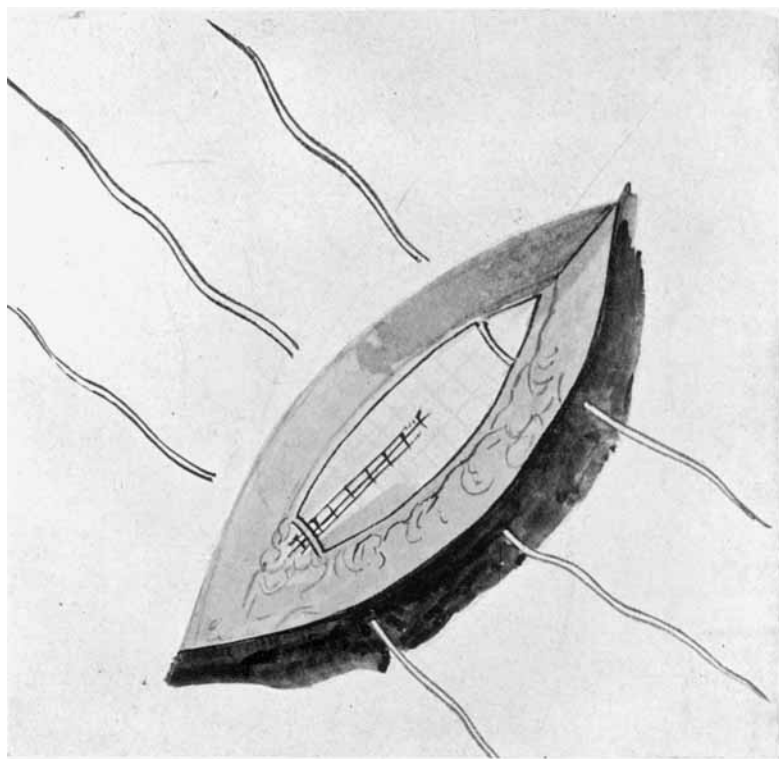


FIG. VI.—The fine silk suture of the “ring” and round ligament completed. The silkworm-gut sutures ready for tying.

side at each stitch. (Fig. V.) After two or three stitches the needle and thread are laid temporarily aside and a "stay-suture" of silk-worm gut passed with a handled needle through the middle of one side of the incision, the deeper fascia, the aponeurosis, the round ligament, and out through the aponeurosis, deeper fascia and skin. Each end of this is seized with catch forceps, and the continuous suture of fine silk is resumed. With this, the so-called ring is completely closed, taking up the round ligament at each stitch till within a few lines of the spine of the pubes, when the excess of round ligament is returned into the remains of the hole in the aponeurosis, and the suture is completed by closing the ring over this as close to the pubes as possible. When this part of the operation is completed the pillars of the ring are brought together, and the ring is wholly obliterated. Just before returning the ligament, I like to clean both it and the wound with a gauze pad wrung out of fresh solution of the red iodide (1 in 1000). The incision is closed by two additional silk-worm gut sutures going through skin and fascia down to the aponeurosis, but not through it. (Fig. VI.) These are placed one on each side of the "stay-suture," and all are tied, bringing the edges of the little wound closely together. The suture on each side of the stay-suture may usually be removed within a week, the stay-suture I usually remove on the tenth day, and the fine silk suture is of course buried and permanent. The only dressing I use is a large sterilized gauze pad, which covers both wounds and is held in place by strapping and a binder.

The patient is replaced in bed with one or two pillows under her knees so as to keep the thighs slightly flexed. If there is very much pain this can always be relieved by a hot vaginal douche, but pain is not generally a very prominent feature, and the less interference with the parts the better.

The little wounds in this operation I look upon as a rather good test for aseptic work, for they are necessarily subject to considerable manipulation. In nearly all my cases in hospital since 1900 (whether public or private) I have obtained immediate "primary" union. In all the cases I have done at the patient's home (but these are not many) I believe there has been some amount of suppuration, which has, however, entirely ceased within two or three weeks of operation.

I usually keep the pessary in place for three months, so as to support the uterus in its new position until the healing has become sound and firm. At the end of the three months the pessary is finally removed, and the patient is set free from all further local treatment. In a year the scars, which lie for the most part under the pubic hair, are almost invisible, and no belt or truss need be worn by the patient at any time.

An analysis of the table I have made of my eighty-five cases gives the following particulars:—

All of these were completed and double operations, therefore the number of operations recorded is 170.

1. There was no mortality.

2. In about 15 or 16 cases there was some slight suppuration. The great majority healed throughout by first intention.

3. In no case was there any untoward complication or result due to the operation, save one case of hernia, which occurred in my earlier practice and does not therefore belong to the later list.

4. With six exceptions I have been able to follow up the after history of all the patients, and I can only find three in which there has been any indication of relapse, and the last time I examined these the uterus was in good position. Some of the cases are, of course, comparatively recent, but most are of several years' standing, and one or two of the early cases have stood a test of eighteen years or more.

5. In 14 cases, 19 pregnancies have followed without any difficulty. Two cases resulted in early miscarriage: one pregnancy proved to be a case of twins with hydramnios, and labour was induced and came on before the children were viable. Among the cases of delivery at term, in one case the child died in birth, and in another the labour was so easy that no one was present and the child is said to have died for want of proper separation and attention. All of the 14 patients had been completely or relatively sterile before operation. Two of the cases of partial failure or relapse occurred after confinement. This proportion contrasts very favourably with those in Howard Kelly's cases of ventral suspension. The cases of repeated pregnancy after operation have been repeatedly examined by myself and others, and in all, I believe, the position remains perfect.

6. In three cases of the 85, the backward displacement was accompanied with marked ovarian prolapse and pain, but it was proved before operation that temporary relief at least could be obtained by mechanical treatment. All of these did well, and in one case the cure was followed by pregnancy.

7. In two cases the backward displacement was accompanied by hypertrophic elongation of the cervix, and the excess of cervix was amputated at the same time as the shortening. In one patient, a newly-married woman, the double condition had prevented any intercourse, and the double operation was very shortly followed by a pregnancy which had an easy and successful issue. In several additional cases other operations were done at the same sitting, such as the stitching of a kidney, the removal of piles, the removal of a fibroid polypus, and the repair of the perineum, but these do not appear to demand any special notice. In one or two of my more recent cases the co-existence of inguinal hernia has been accepted as an additional reason for the operation.

8. Two cases subsequently developed an appendicitis, or there may have been an unobserved appendicitis at the time of operation. Another case subsequently had a tubal pregnancy. The last, though no conclusion can I think be based upon it, is of some importance, as one writer has maintained that shortening of the round ligaments may be a cause of ectopic gestation.* If so, it must, I think, be due to a fault of technique, and should be avoidable. The only conceivable interference with the movement of the ovum in the tube, due to this operation, must be occasioned by very excessive tension or fixation.

9. Two cases, perhaps, should not be included in this list, as the operations were done *not* for backward displacement, but for acute antelexion with incontinence of urine, a condition which (as Macnaughton-Jones has pointed out) has been notably relieved by abdominal fixation. Both cases were immediately relieved by the operation, in one case the relief being, I believe, permanent, in the other the incontinence has, to some extent, returned. In both, the position of the uterus has been improved but the fundus has not been raised to anything like the extent possible in ventral fixation.

10. In looking up the present history of many of my past patients I have been gratified to find that in some cases the late result was far better than I had anticipated. One lady, who came from a distance and had suffered for some years from backward displacement and many nervous troubles apparently connected with this, was grievously dissatisfied after operation. She did not lose her nervous symptoms with the cure of her displacement, and used to write me letters saying that she was sorry she had had the operation done, being rather worse than better for it. Though very careful, as a rule, in selecting my cases, I had no opportunity, before operating, in this one, for such prolonged observation as is necessary for so careful a choice, and I had specially noted it in my list as one in which (for this reason) my judgement had been faulty. Some three or four years passed, and I had quite lost sight of the patient when, in the course of the preparation of this paper a few months ago, I wrote to her asking if she would come up and let me see her again. I was agreeably surprised to find not only that the position remained perfect, but that all her symptoms had been steadily improving since her last letter came, and that she was considerably better than for some years before the operation.

This naturally leads me to a few concluding remarks on diagnosis and selection of cases. I hope it will be recognized that though my list is a very presentable one, dealing, as it does, essentially with one

* Batchelor (F. C.). "Four instances of ruptured ectopic gestation following Alexander's operation." *Journ. of Obstet. and Gyn. of the Brit. Empire*, 1906. Vol. x., p. 618.

operation, yet the twenty years spent in the collection of my cases have an important bearing on the number, and my record bears evidence of considerable operative restraint and care. No one knows better than myself that many cases of backward displacement cause no real symptoms, and are better left alone. These have been carefully excluded. Then many of those transient cases which occur between confinements in married life, and are due to temporary subinvolution, are very amenable to treatment by drugs and the occasional use of a pessary. These also have been for the most part excluded. The cases chiefly chosen have been those of complete displacement in single or early married life, where there is no hope of pregnancy temporarily to correct it, and serious complaint is made of constant backache, dysmenorrhœa, menorrhagia, and discharge due to accompanying endometritis. I prefer, if possible, to find a suitable, well-fitting pessary, and to prove that most of the symptoms are greatly relieved by replacement and the use of this before resorting to operation. Further, if I am allowed to have my way, I remove this pessary after a few months, and prove that on its removal the case relapses and the symptoms return. Then, I have every confidence in advising the radical cure. And when I remember patients in bygone years who, in spite of fifteen or twenty years of pessary treatment, were never well, and not infrequently fell victims to one of the forms of infection so often associated with this method of continued treatment, I cannot but be thankful that so innocent and comparatively inexpensive and effective a method has been devised and perfected for the permanent relief of their troubles.

But the skill and observation necessary for correct diagnosis and good treatment demand both experience and patience. The best use of the operation will, I think, be made by the practising gynecologist rather than by the surgical operator only. On several occasions patients have been brought to me for operation by this method when I have been reluctantly forced to the conclusion that the cases were quite unsuitable. In a recent case of this kind all the plain or primary indications were those of a painful retroflexion. On full examination, however, I found indications of some abdominal tumour ("probably a myoma"), and advised abdominal section instead of the small operation which had been anticipated. The successful treatment of the case involved a difficult hysterectomy, which I carried out a little later. It may be well to remember that backward displacement of the uterus is very apt to occur as a secondary consequence of intra-abdominal disease, after appendicitis, salpingitis and myoma, for example (perhaps from the straining caused by the pain) and when the backward displacement is complete it conceals the tumour or inflammation above it. This I pointed out in an article on "Concealed Pyosalpinx" in 1894. Such conditions need rigid exclusion before the round ligament operation is considered,

for in one case (only a short time after this operation had been done by another surgeon) I was forced to open the abdomen in order to relieve the pain of diseased appendages which had been made rather worse than better by the shortening of the ligaments. So important is this, that if any operator lacks diagnostic experience, and is in doubt, I would myself advise him to open the abdomen and treat his case by ventral suspension if he cannot leave it alone until further light is obtained upon the condition.

Finally, I think it is partly owing to some care in the selection of my cases that I have but few failures to report in the successful performance of the operation.

When there are intraperitoneal adhesions or tumours fixing the uterus, or when there has been old pelvic cellulitis, it is obvious that the drawing out of the ligaments may be very difficult or impossible. Three times in my early practice I have set out to perform the operation and have entirely failed, either from inability to find the ligaments or from some kind of adhesion or fixation, but this experience has not occurred during the course of my last 60 cases. Sometimes it may have been difficult to find the ligaments, for they are occasionally very poor and attenuated, but nothing has prevented the satisfactory completion of the operation in all the cases recorded. I have, therefore, considerable reason and confidence in stating that one need not fear that the operation will be impossible to finish if proper care is taken in the selection of the case, and if the surgeon has good practical acquaintance with the anatomy of the region involved. Both Dr. Alexander, of Liverpool, and Dr. Kellog, of Michigan (whose work on this subject I cannot too warmly commend), advise the use of an aneurism-needle or small hook to draw the contents of the canal outside of the incision. I have tried this, but I (personally) find it to be embarrassing and inconvenient. The method I have described is—to me—much more satisfactory. The chief point that has helped me is, I think, the recognition of the fact that the round ligament is undermost and lowest, resting practically on Poupart's ligament.