

ASHBY (THOS. A.)

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STUDY OF THE OPERATION
OF SHORTENING THE ROUND
LIGAMENTS. — ALEXANDER'S
OPERATION.

—BY—

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Professor of Gynecology in the Baltimore Polytechnic
and Post-Graduate Medical School, etc.

(Read before the Baltimore Academy of Medicine, February
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There can be little doubt of the fact that the uterus is the most movable organ in the female body. It changes its position in the pelvis with each inspiration and expiration, rising and falling with rhythmic precision. Its axis in the pelvis is constantly influenced by the contents of the bladder and rectum, being displaced forwards or backwards by the fullness or emptiness of these organs. This latitude of motion has been wisely provided for by the character of its anatomical arrangements and sup-

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ports. At once restrain the uterus from assuming its various normal relations to other pelvic organs and viscera, and the consequences become apparent. The extent of motion allowed the uterus is a varying quantity within certain limits. The exact position of the uterus in health is a point which can not be established, since with every woman the relation of this organ to other organs is as variable as the shape of the nose or the expression of the features. The uterus is found turned or flexed at different angles in many individuals without giving rise to the least inconvenience, whilst in others the slightest deviation of the organ from its normal axis in the pelvis is accompanied by distressing symptoms.

The uterus is supported in the pelvis by tissues which perform the function of bumpers rather than the support of strong ligaments, hence its support is to be measured rather by the tonicity of the tunics which invest it than by connecting fibres which restrain it like so many stays or braces. The body of the uterus is invested by the peritoneal membrane, which, though closely adherent to its anterior and posterior surfaces is given off in folds on its lateral borders to form the so-called broad ligaments. As the peritoneum is re-

flected from the anterior and posterior surfaces of the uterus it turns up over the bladder in front and rectum behind to form the so-called utero-vesical and utero-sacral ligaments. In addition to these so-called ligaments two rounded cords, made up of areolar tissue, vessels and nerves, besides a dense bundle of fibrous and muscular tissue, are given off from the sides of the uterus, near the fundus, and curving around between the folds of the broad ligaments pass through the internal abdominal ring along the inguinal canal, and, as they emerge from the external abdominal ring, are lost in the tissues of the labia-majora. These cords are known as the round ligaments. They present the appearance of a true ligament, and may be so regarded. These ligaments are between four and five inches in length, and as they run in a tortuous direction through the folds of the broad ligaments and curve round the sides of the bladder, they hold the fundus of the uterus nearer to the symphysis than their length would indicate. It is believed by some anatomists that the round ligaments have the peculiar function of drawing the uterus towards the pubis. They are also believed to aid in fixing the uterus in its proper axis in the pelvis. In addition to the supports

mentioned, the uterus is held in its position in the pelvis by the walls of the vagina which surround the cervix and embrace it as a keystone at the arch of the vaginal roof. The vagina in turn is maintained in its long diameter by the tonicity of its muscular and cellular coats, and by its attachments to the bladder in front and rectal wall behind. When all of these tissues are in a condition of tonicity they conjointly support the uterus and pelvic organs. When greatly relaxed from any cause they allow the uterus to sag down in the pelvis and to draw down its natural supports. Thus prolapse of the uterus necessarily drags down its peritoneal investment and the round ligaments, depresses the vaginal arch at the cervix and draws in the anterior and posterior vaginal wall, first at the internal end of the vaginal tube and next along its entire extent. This process of decent may be reversed in those cases of rectocele or vesicocele where the uterine support is weakened at the external end of the vaginal tube. When the tissues which make up the pelvic roof retain their tonicity, even in the absence of vaginal support, the decent of the uterus is resisted and the organ can only be dragged down through the vulva by overcoming this resistance. When the uterus is

strongly seized with vulcellum forceps and drawn down in the vagina, we have this condition. The broad ligaments are put on the stretch, the bladder is drawn down with the uterus, owing to the intimate connection between the two; the rectum is not disturbed, owing to the loose attachment of its subperitoneal connective tissue to the vagina. If the broad ligaments now be severed complete prolapse of the uterus is secured. The round ligaments are the last tissues put on the stretch. From this history of uterine prolapsus here described, it would seem that the round ligaments play a very insignificant part in supporting the uterus, whilst the broad ligaments and utero-vesical and utero-sacral folds of the peritoneum materially add to the support of the organ.

When we come to study the causes of version and flexion of the uterus we find the same deviations from the normal axis with variations within health according to the individual point.

Anteversión is regarded by anatomists as the normal position of the uterus. In childhood, and in the woman who has not borne children, the uterus is almost invariably turned forwards. The reverse position, retroversion, is the most frequent form of displacement.

Uterine flexions are almost invariably due to faulty nutrition of the uterine muscles, but they may result from overpressure from tumors, or from intestines forced down into the pelvis by tight lacing. Flexions may occur in the cervix or in the body. The first named variety is referable to undue length of development, the elongated cervix being bent upon itself by mechanical pressure. Flexions of the body of the uterus must be attributed to the weakened supports of the uterine walls, which yield under super-imposed weight, either connected with the uterus itself, or external to the organ. The broad ligaments undoubtedly exercise an influence in the prevention of versions and flexions, but where these supports are relaxed or over-stretched by constant strain exercised upon them their restraining influence is overcome. The uterosacral and uterovesical ligaments are simply folds of peritoneal tissue, which exercise but partial resistance against version and flexion. The function of these ligaments seems to be to aid in the suspension of the uterus in the pelvic canal. The round ligaments coming off from the fundus and passing forwards into the inguinal canal undoubtedly exercise a strong influence in preventing posterior displacement of

the uterus. Their course around the bladder is somewhat tortuous; this may allow a certain amount of lengthening, estimated at from two to three inches, before they are made taut by the posterior displacement of the uterus. The round ligaments exercise but little, if any, influence in preventing prolapse of the uterus. Savage has shown that after all other supports to the uterus are severed they are the last made taut by procidentia. In view of the fact that the round ligaments have the power of drawing the fundus of the uterus forwards, the advantage of shortening their length in cases of posterior uterine displacement is now an established fact. As far back as 1840 Alquié, a French surgeon, proposed the operation of shortening the round ligaments, but he failed to demonstrate the value of this procedure upon the human female. It was not until 1881 that the operation was performed upon a woman. On Dec. 14, of that year, Dr. Wm. Alexander, of Liverpool, operated successfully on a case of prolapsus uteri, by drawing out and shortening these ligaments. Whilst not the originator of the operation, to Dr. Alexander belongs, therefore, the credit of its first performance. The operation very properly now bears his name. Since Dr. Alexander first oper-

ated he has been an earnest advocate of its advantages and he has performed the operation more frequently than any other surgeon, with results of a very satisfactory character. The Alexander operation has now been performed over 200 times in this country and in Europe, by a number of different surgeons, with varying degrees of success and with corresponding differences of opinion as to its value. It is a procedure which is still under trial and criticism. It is incumbent upon those who have had an experience to record the same. It is by a study and comparison of the various steps of the procedure and a report of results that its advantages and disadvantages will become apparent. Having performed this operation in June last, I shall present a report of the case and then discuss a few of the steps of the procedure.

Mrs. ——— aged 50 years old, a widow. has suffered for a number of years with uterine disease. For four or five years previous to the date of operation she was almost a confirmed invalid, her life being a burden to herself, and as she imagined, to her friends. During this time she had been under the treatment of several well-known and skillful gynecologists, both of whom had recognized her true condition but had afforded her

only very temporary relief. Becoming discouraged she wandered from one physician's office to another until local and general medication had been faithfully tried. She still remained the victim of morbid anxiety and severe suffering. Coming under my treatment in the early part of last year, I succeeded, as did my predecessors, in obtaining her consent to a vaginal examination. She was flooding profusely at the time, so that I administered ergot and desisted from an exploration until hemorrhage had ceased. I learned from her history that she was subject to intense menorrhagia, which invariable left her weak and prostrated from the loss of blood. In person she was plump and well-nourished, but her skin and conjunctivæ were extremely pale and anæmic. She was extremely nervous and dejected in spirits, and longed for death as the surest way of escape from mental and physical suffering. She manifested no hope of relief, but expressed a great willingness to undergo any plan of treatment that would give her some benefit. A few days subsequent to the time she first came under my care, I succeeded in making a physical exploration, and I found that her condition coincided with the history related by her, which she had obtained from other physicians. Her

uterus occupied a low position in the pelvis; the body of the organ was large, flabby and relaxed; the fundus rested against the sacrum; below the promontory, on its posterior wall, were several fibroid tumors, interstitial, varying from the size of a walnut to a medium-sized apple. These growths were irregular in shape and outline, and presented a hard nodular feeling to the touch. The uterine cavity was tortuous, roomy, and admitted the sound to the depth of $3\frac{1}{2}$ inches. The uterus was perfectly movable and could be easily elevated into its normal axis, but the moment support was withdrawn it tumbled back into its acquired position. The pressure made against the rectum by the displaced organ was the chief source of discomfort. The patient suffered from a distressing flatulent dyspepsia and from constipation. The pressure of the uterus prevented an escape of flatus by the rectum and also occasioned such suffering that defecation was performed with the utmost difficulty. Enemas, or laxatives, were invariably required to secure a passage from her bowels. So long as the uterus was maintained in its normal position these symptoms were relieved. It was quite evident that the mechanical pressure of the displaced organ was the prime cause of both physi-

cal and mental distress and also contributed in a measure to the profuse loss of blood during menstruation. The congestion at the menstrual epoch occasioned most violent cramps, nausea and other disturbances so that the recumbent posture was required during all of this time.

It was my opinion that any mechanical contrivance which would hold the uterus in position would relieve the pain and distress consequent upon displacement.

I determined at once to use a properly fitting pessary, but was informed by my patient that she was unable to wear pessaries, that she had worn a number without relief. I insisted upon further trial, and during the next two months I employed every mechanical device which I could obtain, with total failure.

I then suggested the Alexander operation and explained the advantages of the procedure in her case. She readily consented, and in fact urged me to undertake the operation; she was more anxious than I was to test its value. Whilst I believed in the *rationale* of the method proposed, I had some misgiving as to the value of the method in her case, though it seemed to me that if her uterus could be drawn forwards and fixed the tendency to displacement backwards

would be removed. At this juncture I was greatly aided by the experience, skill and anatomical knowledge of my friend, Dr. Randolph Winslow, of this city. Dr. Winslow had performed this operation twice upon the living subject, and had also demonstrated upon the cadaver the fact that the uterus could be easily elevated into position by the round ligaments and there be retained by traction upon them.

The operation was performed on the 8th day of June, with the assistance of Drs. R. Winslow, John G. Jay and W. J. Chappell. After etherization an incision was made over the external abdominal rings and the superficial tissues were cut through until the external ends of the round ligaments came into sight. These were dissected out and the ligaments were gently drawn through the canal until some three inches of their length were external to the canal. As traction was made on these ligaments the uterus was observed to rise in its normal axis in the pelvis. A sound was inserted into the uterus to aid in its replacement. Having demonstrated a correct position of the uterus, the ligaments were attached to the line of incision by buried cat-gut sutures. Cat-gut threads were also placed along the floor of the wounds to act as drainage tubes. The

wounds were then closed. After closure of the wounds the sound was withdrawn from the uterus and a suitable pessary was introduced to aid in the support of the uterus until union had been secured. Primary union took place, with the exception of a slight discharge of pus along the tract of the cat-gut drainage threads. Within ten days the parts were entirely well. The patient had no trouble referable to the operation. Her temperature at no time was elevated above 100° F. After three weeks she was allowed to get out of bed and from that time onward her improvement was continuous. On October 11th last, I received the enclosed letter from her which explains her condition at that time.* I have seen her frequently since and at this time of writing her health is so vastly improved that she is able to do any ordinary domestic duty. She has been relieved of the suffering incident to the mechanical pressure of the uterus on the rectum. She has had no show of

*BALTIMORE, October 10th, 1886.

DR. ASHBY, DEAR SIR:—I am happy to state that I have been very much benefitted by the operation you performed on me last June. Previous to this I was a great sufferer and could not sit up one hour with any degree of comfort. I can conscientiously say that I think the Alexander operation a great boon to those who suffer from displacement, and I would be more than willing to talk with any sufferer who is in doubt about it.

Yours Truly,

Mrs. _____

blood since Nov. last. It is believed that the menopause has been reached and that her general health will improve from this time forward, as the great drain from loss of blood has been stopped. Before this operation was performed my patient could not walk across her room with comfort; she was on the verge of complete invalidism. She is now able to walk where she pleases, run up and down stairs with ease and agility. She has informed me that she has recently walked fourteen squares on shopping expeditions with comfort. Her mental and physical condition are so markedly improved that she seems unlike the same individual.

I have had no opportunity and no occasion to make a vaginal examination to verify the position of the uterus. Her sense of comfort and ease of motion are sufficient to prove to my mind that the uterus is now in proper position.

The inquiry may be suggested, How long will it remain in its normal axis? My answer is the remainder of her natural life. I see nothing in the present condition of the uterus to favor any other view. The organ has had its normal stays restored by shortening their redundant length. The menopause has been established and the weight of the fibroid tumor will become less and

less, now that this has been declared. As a matter of safe precaution and of increased comfort a pessary will be worn for such a length of time as may seem judicious. It must be borne in mind that previous to the operation she was unable to wear a pessary with comfort.

Remarks. The case here reported illustrates in a very satisfactory manner the advantages of the Alexander operation in certain forms of posterior uterine displacement. The uterus having been dragged from its normal axis by fibroid growths upon its posterior wall, had remained in this false position for some years. The nutrition of the organ had been impaired, its size increased and a general relaxation of its muscular tone and ligamentous supports had been induced by these same growths. Whilst the organ could be readily restored to its position it was found impossible to retain it *in situ* by any mechanical contrivance which had been employed. Pessaries gave intense distress and could not be worn continuously for a longer period than one or two days at a time. They did but little good when employed. It was quite apparent that no form of mechanical support would be of service in this case, except a restoration of the normal ligamentous supports which had become relaxed and over stretched

by the continuous weight of the displaced organ. The results have demonstrated the correctness of these views. It is in just such a condition of posterior displacement as has been recorded in this case that we have the promise of satisfactory results from shortening of the round ligaments, and in which the advantages of this procedure are most conspicuous. I fail to see any striking advantage which will follow the shortening of the round ligaments in cases of procidentia uteri. The round ligaments can exercise but a feeble power in preventing the uterus from descending in the pelvic canal. It has been shown by careful demonstration that they are the last of the uterine supports to become taut in downward displacement. It is therefore doubtful whether shortening of these ligaments, in the absence of a restoration of the perineal support, would render any material or durable service. Nor do I believe the Alexander operation is destined to meet with success in cases of posterior displacement where adhesions have formed between the uterus and rectal tissues. In such cases more or less violence is required to sever the attachments before the uterus can be drawn into its axis by traction on the round ligaments. The advantage of the procedure under such circumstances

seems of doubtful propriety. In those cases of posterior displacement where the uterus is easily replaced by sound or finger, where the muscular tone is simply impaired and where pessaries are worn to no advantage, or with distress, the procedure under consideration is, in my judgement, not only admissible but positively indicated.

The Alexander operation has a limited field of usefulness, but when properly employed within the limits assigned to it, it is in my belief one of the most valuable procedures contributed to surgery within the last decade.

In this connection it is proper to discuss a few of the steps of the procedure. *First*, as regards the danger of the operation. As far as I have been able to collect statistics, the mortality has been less than two per cent. The operation is as nearly devoid of danger as any procedure can be, if it is properly performed. Among the cases reported death was attributed to pyæmia in three cases, which resulted from want of care and cleanliness. Peritonitis is a source of danger, since it is possible to injure this membrane in drawing the ligament through the canal. With ordinary care the peritonæum can be discovered and its injury avoided. *Second*, the difficulty of finding the ligaments has been re-

ferred to by several operators. In the case here reported no trouble, in this respect, was experienced. With proper care and a knowledge of the anatomical arrangements the ligaments can be brought into view by cautious dissection. In a report of forty cases, made, in November, 1885, by Dr. Alexander, this difficulty was not experienced. Imlach, of Liverpool, has reported thirty-six cases without difficulty in finding the ligaments in a single case. As opposed to this experience Murd , of New York, was unable to find the ligaments in three cases out of six cases; he therefore claims that this is an element of uncertainty in the operation. The fact that the inability to find the ligaments has occurred in less than four per cent. of the cases reported is but a slight disparagement to the operation. Such a failure upon the part of the operator only necessitates the closure of the incision and leaves the patient in the same condition she was in prior to the attempt.

I quite agree with Dr. Alexander in the statement that the operation is a delicate one and quite different from ordinary procedures. The external end of the ligament lies imbedded in the tissues and will be readily overlooked if not carefully dissected out. Its white sheen can be made to appear when

gently drawn out of the ring. It then has the appearance and structure of a true ligament. The after-treatment of the operation should be conducted on strict surgical principles.

The following summary of conclusions is offered.

1st. The round ligaments are designed to hold the uterus in its axis in the pelvis and to draw the fundus of the organ towards the symphysis pubis. They have little if any sustaining power in preventing procidentia, except in extreme degrees of descent where the organ has escaped external to the vulva.

Posterior displacement of the uterus can only take place when the round ligaments have been relaxed or stretched by prolonged tension.

2nd. Shortening the round ligaments is a practical method by which the uterus may be lifted into its normal axis and be retained in position by a restoration of its normal supports.

3rd. This operation is admissible in all cases of posterior displacement where the uterus is not fixed by adhesions, but perfectly movable in the pelvis, and where other methods of support are not of service.

4th. The operation can prove of little value in cases of procidentia, except when employed in conjunction with

other methods instituted to overcome this form of displacement.

5th. The operation can be easily performed by one who is familiar with the anatomy of the parts. It is almost devoid of danger if ordinary safeguards are employed.

6th. In the class of cases to which it is limited the benefits secured are striking and important.



