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**RETROSPECTIVE STUDY
OF
REPRODUCTIVE PERFORMANCE FOLLOWING
SHIRODKAR'S ABDOMINAL SLING OPERATION
FOR TREATMENT OF UTERINE PROLAPSE**

THESIS

Submitted for Partial Fulfillment of
Master Degree in Gynaecology and Obstetrics



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INTRODUCTION AND AIM OF THE WORK

Prolapse, procidentia (from the Latin word procedure, to fall) or downward descent of the vagina and uterus is a common and disabling condition (*Tindal, 1987*).

Female urogenital organs are supported by:

1. Cardinal and uterosacral ligaments.
2. Pelvic diaphragm and levator ani muscles.
3. Tone of the vagina (*Allahbadia and Rambiye, 1992*).

Uterine prolapse is usually due to weakness of its fascial supports. This may be an inherent or congenital weakness in multiparous as well as in nulliparous patients with prolapse and it is more obviously due to atrophic changes which accompany the menopause (*Arthur, 1957*).

Only 2% of women who develop prolapse are nulliparous, the latter have a history of long duration of physical labour or long standing increased intra-abdominal pressure.

Due to malnutrition and young age of marriage, cases of congenital prolapse are more common in developing countries and this group includes those who have prolapse after their first delivery. In these women the tendency of prolapse is already present and pregnancy and child-bearing bring it to light (*Allahbadia and Rambiye, 1992*).

Most of the surgical procedures are designed for older women, fertility and uterine preservation are not factors generally considered important. In young age groups, the surgeon must correct the immediate problem of prolapse, preserve a functional vagina yet not diminish the patient's child bearing potential (*Richardson et al., 1989*).



Some parous women with symptomatic uterine prolapse who seek relief of their symptoms express the desire to retain their uterus and their fertility (*Nichols, 1991*).

Shirodkar (1958, 1959, 1960) devised an operation for prolapse during the child bearing period where the uterosacral and cardinal ligaments are too weak for an extended Manchester operation (*Dasture et al., 1967*).

The Shirodkar sling operation consisted of fixing the sling of mersilene tape posterior to the cervix carrying it extra-peritoneally from both sides of the rectum and fixing it to the anterior longitudinal ligaments over the sacral promontory. On the left side, the sling had to be looped round a psoas hitch to prevent pressure on the sigmoid colon (*Allahbadia and Rambhiv, 1992*).

In recent literature few articles are dealing with evaluation of the operation not only from the view of displacement and corrections but from the reproductive performance following the operations which needs more elucidation.

For that, this work aims to study of all cases done in the last 3 years in Ain Shams Maternity Hospital including the time of the study to add another experiences in two subjects.

ANATOMICAL CONSIDERATIONS OF UTERINE SUPPORT

The fundus of the uterus lies just above the pelvic brim and the cervix lies on a level with and adjacent to the ischial spine.

The uterus is lowest when the patient is in the erect position and is actually when sitting than standing. The supravaginal cervix is relatively fixed and movement or displacement of the uterus often consists in rotation of the organ around this axis or in bending of the corpus on the cervix (*Smout et al.*, 1969).

Tindal, (1987), mentioned that the uterus is bent forward on itself in attitude of ante flexion. The bend is situated about the level of internal os. Also, the axis of the cervix is inclined forwards at an angle approximately 90 degree to the axis of the vagina giving rise to a state of anteversion. Version and flexion are not always in the forward direction and approximately 15% women have uteri which are retroverted or retroflexed or both. The uterus is held in a position of ante flexion and anteversion by its weight, by the round ligaments which hold the fundus forwards, and by the uterosacral ligaments which keep the supravaginal cervix for back in the pelvis. The broad ligaments and their tissue also have a steadying effect on the uterus. The round & broad ligaments do not however, have any significant action in preventing descent of the uterus. This function is performed almost entirely by the transverse ligaments and their posterior extensions the utero sacral ligaments, these are inserted into the supravaginal cervix and the upper vagina, and their support

of the vaginal vault is also important in preventing uterine prolapse.

Browne, (1950) mentioned that the uterus lies in a position of anteversion and slight antelexion with the external os at the level of the ischial spine. It is maintained in that position by:

- The cervical ligaments.
- The pelvic floor.
- The anteverted position of the uterus.

Smout, et al., (1969) stated that the supports of the uterus can be classified anatomically as direct and indirect:

Direct Supports

- The vagina.
- The pelvic connective tissue and fascia forming the:
 - Pubocervical ligaments.
 - Transverse ligaments of the uterus.
 - Uterosacral ligaments.

Indirect Supports

- The levator ani and coccygei.
- The urogenital diaphragm.
- The perineal body.

*Review
of Literature*

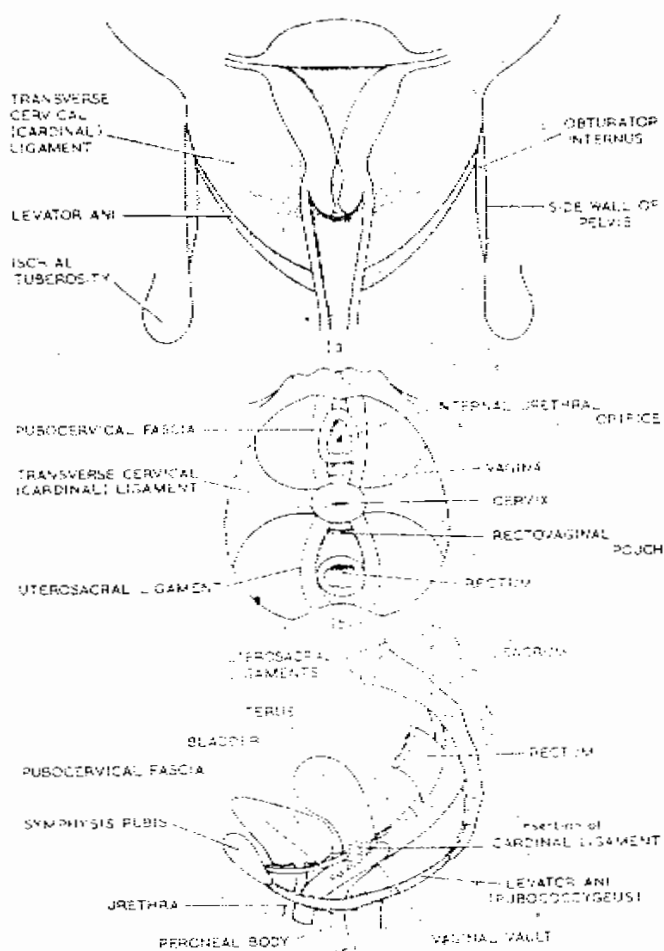


Fig. (1): Diagrams to show supports of uterus.
(Quoted from *Gynaecology by Ten Teachers*, 1985)

THE CERVICAL LIGAMENTS

Howkins and Hudson, (1977) defined the pelvic fascia as the fascial tissue which covers the upper and lower surfaces of the levator ani muscles, together with the medial surfaces of the two obturator internus muscles.

Between the pelvic fascia and the peritoneum above, all the loose tissues are referred to as the endopelvic fascia and this fascia is condensed to form uterosacral ligaments and transverse cervical (Cardinal, Mackenrodt's) ligaments. These condensations are always present, although in case of prolapse when the tissues are lax they may not be prominent.

Transverse Cervical Ligaments

The transverse cervical or cardinal ligaments (Ligament of Mackenrodt). One on each side are usually described as condensation and thickening of the pelvic cellular tissue around the sheathes of uterine vessels (*Browne*, 1950).

The cardinal ligaments run from the supra-vaginal cervix and lateral vaginal walls above the levator ani diaphragm outwards to be inserted into the fascia covering the side walls of the pelvis along the line of attachments of the levator ani muscles (*Browne*, 1950).

The cardinal ligaments contain unstriated muscle continuous with that of the other longitudinal muscle coat of the uterus. They sling the uterus and vagina up at their normal level in the pelvis and so tend to prevent prolapse of those organs. It is believed that much of their efficiency is due to their content of involuntary muscle and that atrophy of the muscle after the menopause predispose to prolapse (*Browne*, 1973).

The Uterosacral Ligaments

The uterosacral ligaments are paired ligaments. They are attached anteriorly to the posterolateral aspect of the cervix at the level of the internal os. Posteriorly, they are attached to the pre-sacral fascia opposite the lower portion of the sacroiliac articulation. From the anterior third, fibrous bands course downwards to be attached to the lateral vaginal fornices (*Browne, 1973*).

The function of the uterosacral ligaments is to maintain the uterus in anteversion and the cervix at a right angle to the vaginal axis and to assist suspension of the upper part of the vagina. So to help to prevent prolapse of the uterus and vagina and to keep the cervix braced back against the sacrum and thus prevent retroversion because of the absence of the smooth muscles from the posterior third (*Danforth, 1977*).

Plication and shortening of the uterosacral ligaments have been employed to elevate the cervix for correction of symptomatic retroversion of the uterus (*Weed, 1972*).

Pubocervical Ligaments

The pubocervical ligaments consist of two horizontal parallel strands on either side of the mid line, attached anteriorly to the pelvic surface of the body of the pubis and posteriorly to the vaginal vault and adjacent supravaginal cervix. As they pass backwards from the pubis these ligaments become attached to the neck of the bladder and from here strands radiate laterally across the pelvic floor to the arcus tendinous. The pubovesical ligament and the lateral strand constitute the true ligaments of the bladder and support that organ (*Smout et al., 1969*).

The pubocervical ligaments strength the anterior vaginal wall and act as a shelf on which the bladder rests. The pubocervical ligaments can be used in the repair of cystocele, urethrocele and uterine prolapse. Relaxation of these ligaments is liable to cause the bladder to herniate through the unsupported anterior vaginal wall (*Browne, 1950*).

Pelvic Floor

The pelvic floor consists of all tissues lying between the pelvic cavity and the surface of the vulva and perineum. It includes:

1. The pelvic peritoneum.
2. Extra peritoneal fat and cellular tissue.
3. The levator ani and their fascial coats.
4. The urogenital diaphragm (triangular ligament).
5. The muscle of the perineum and their aponeurosis.
6. Subcutaneous fascia and fat.
7. Skin.

The most important of those structures are the levator ani muscles and these together with the fascia which covers their upper and lower surface are collectively called the pelvic diaphragm. (*Tindal, 1987*).

The Levator Ani

Consists of three muscles:

- The pubococcygeus.
- The iliococcygeus.
- The ischiococcygeus.

The pubococcygeus is by far the most important and significantly it is the part that is best developed (*Smout et al.*, 1969).

The Pubococcygeus

It should be considered as a single, centrally situated muscle which arises from the pelvic aspect of the body of the pubis and from the white line of the pelvic fascia which lies in front of the obturator canal. From this origin, its fibers sweep backwards as three distinct bands. The most medial fibers skirt the urethra, blending with its intrinsic muscle coat. They form a U-loop around the vagina and inserted into its lateral and posterior walls and into the central point of the perineum. These fibers constitute the pubovaginalis.

The intermediate fibers called the "pubo-rectalis", form a U-loop around the anorectal junction and are inserted into the lateral and posterior wall of the anal canal between the sphincter ani internus and sphincter ani externus blending with these two muscles.

The most lateral fibers have a Y shaped insertion into the lateral margin of the coccyx and this part of the muscle is known as the "pubo-coccygeus proper" (*Smout et al.*, 1969).

The Iliococcygeus

It is a bilateral muscle arising from the part of the white line which lies behind the obturator canal. It blends with the lateral fibers of the pubococcygeus proper and it is inserted into the sides of the coccyx (*Smout et al.*, 1969).

The Ischiococcygeus

It is a bilateral muscle arising from the pelvic aspect of the ischial spine. It is inserted into the lateral border of the

coccyx and the last piece of the sacrum. This becomes known as the coccygeus (*Smout et al.*, 1969).

Nerve Supply

The levator ani muscle is supplied by the perineal branch of the 4th sacral nerve and by the inferior haemorrhoidal nerve, a branch of the pudendal nerve from S 2, 3, and 4 (*Smout et al.*, 1969).

Action of The Levator Ani Muscle

The pubococcygeus supports the urethra, bladder, vagina and rectum. The pubovaginalis, in addition, constricts the vagina when it contracts as in vaginismus.

The puborectalis forms a sling for the rectum and acts as an auxiliary sphincter for the anal canal. On contraction its lateral fibers pull the anorectal junction forwards, thereby increasing the anorectal flexure and retarding the faecal descent.

The levator ani plays an important part in the maintenance of the intra-abdominal pressure which is raised by simultaneous contractions of the muscles of the anterior abdominal wall, diaphragm and the pelvic floor. (*Smout et al.*, 1969).

Anteverted Position of the Uterus

Normally the axis of the uterus is about perpendicular to that of the vagina. If the uterus becomes retroverted to lie in the axis of the vagina, the intra-abdominal pressure will tend to force it downwards along the vaginal canal. Therefore, predisposing to or aggravating an existing prolapse (*El-Sadek*, 1972).

Skeletal Support:

Ulfelder (1956), pointed that in young adult female, the bulk of pressure exerted by the intra-abdominal musculature is absorbed by the pubis, anterior pelvic girdle, and the iliac bones.

Weed (1972), reported that he have measured the angle of pelvic inlet in number of young women in the erect position and have found that the angle between the superior margin of the pubis and the anterior margin of the sacrum or the 5th lumbar vertebra in subluxation and the vertical plain, is about 30° in young healthy women. With advancing age, this angle may increase to a maximum of 52°, thereby directing greater intra-abdominal pressure through the pelvic inlet up on the pelvic fascia and the pelvic diaphragm and contributes, substantially, to prolapse of the pelvic viscera in parous females.

He mentioned that the axis of the outlet points downwards and backwards, and the sacrum assumes a more horizontal plain in relation to the vertebral column. In fact the tip of the coccyx is above the lower margin of the pubis and the angle of the outlet measures between 10°-15° with the horizontal.

Round Ligaments:

These run on each side from the cornu of the uterus below the entrance of the tube forwards and outwards to the internal abdominal ring. From there, the round ligament traverses the inguinal canal and passes through the external abdominal ring to the front of the pubis where its attenuated fibres are lost in the labium magus. The ligaments are composed of fibrous

tissues and muscle but probably have little or no action in maintaining the position of the uterus because:

- a. They do not run directly forward, but curve forwards and outwards.
- b. In the normal woman, the ligament is not under tension.
- c. It is a mere accident of development that the ligament has become attached to the uterus (*Browne, 1950*).

Broad Ligaments:

The broad ligaments are simply double folds of peritoneum stretching out from the sides of the uterus to the walls of the pelvis, where the layers diverge to cover the pelvic walls. They contain some areolar tissues between them and carry the blood vessels, nerves and lymphatics of the uterus, tubes, and ovaries to and from those organs. The broad ligaments play little part as supports of the uterus. They simply act as thin slings and are very mobile (*Bowes, 1950*).