



MACROJOURNALS

# The Journal of **MacroTrends** in Health and Medicine

## CURRENT APPROACH TO LIGAMENTS OF UTERUS

ÖZLEM KAŞTAN\* and KADRIYE CENGİ UĞURLU\*\*

\*Akdeniz University, Turkey

\*\*Aydın Special Egeliva Hospital, Turkey

### Abstract

*The ligaments of the female reproductive tract are a series of structures that support the internal female genitalia in the pelvis. M. Levator ani and the ligaments carry the internal female genitalia. M. Levator ani; is an important, large and thin muscle that covers the pelvic floor. These ligaments are, ligamentum(lig.) transversum cervicis(colli), lig. pubocervicale, lig. sacrocervicalis, lig. latum uteri and lig. teres uteri. Lig. transversum cervicis(colli); are also known as Cardinal ligaments, or Mackenrodt's ligaments. These ligaments arise from the side of the cervix and the lateral fornix of the vagina. Lig. pubocervicalis; are bilateral structures, which attach the cervix to the posterior surface of the pubic symphysis. Lig. sacrocervicalis; are also bilateral fibrous bands, which attach the cervix to the sacrum. They have a fibro-muscular structure. Lig. latum uteri(Broad lig.); The Broad ligament is a flat sheet of peritoneum, associated with the uterus, fallopian tubes and ovaries. Lig. Teres uteri(lig. Rotundum); It originates at the uterine horns, and attaches to the labia majora, passing through the inguinal canal. Today, it is very important to know the structures carrying the uterus in the surgical procedures and in the diagnosis which will be applied to the uterus and the surrounding structures in the clinic.*

Keywords: Ligament of Uterus, Current, Approach

### 1. Introduction

The ligaments of the female reproductive tract are a series of structures that support the internal female genitalia in the pelvis. Levator ani muscle and the ligament carry the internal female genitalia.

Levator ani muscle; is an important large and thin muscle that covers the pelvic floor. Levator ani muscle and fascia diaphragmatis pelvis superior are the most important structures carrying the internal female genitalia. Medial of the proximal part of this muscle extends to the cervix uteri

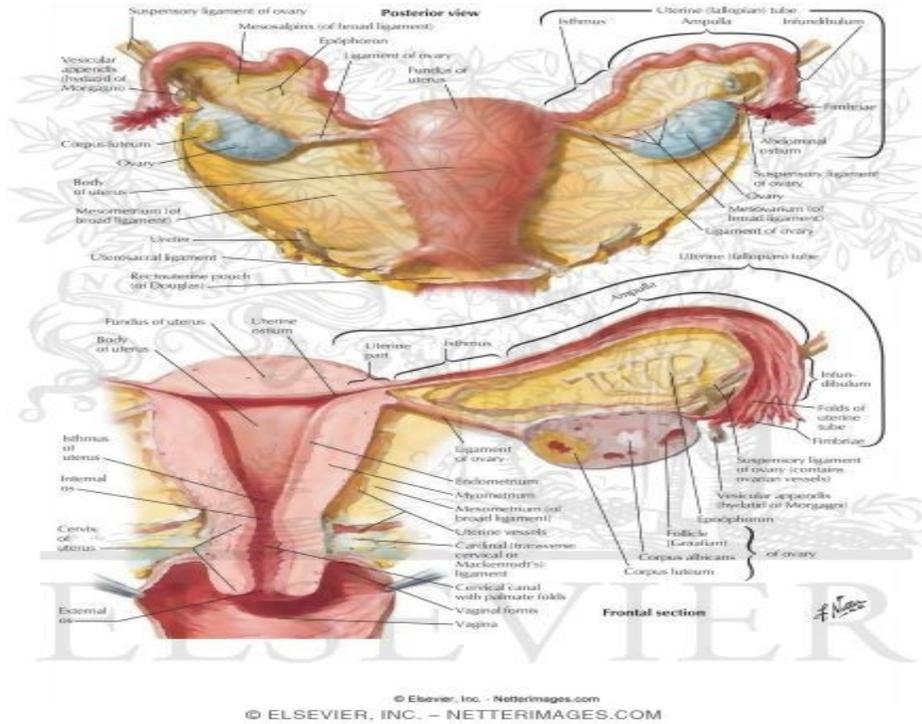
that avoid desensus of uterus and also regulate the intra abdominal pressure. Some of these uterus ligaments are periton plicas and some of them are fibrous band of tissue and smooth muscle. These are; ligamentum(lig.) transversum cervicis(colli), lig.pubocervicale, lig. sacrocervicalis, lig.latum uteri and lig.teres uteri (Arıncı and Elhan, 1997).

Lig. Transversum cervicis (colli): are also known as Cardinal ligaments, or Mackenrodt's ligaments. These ligaments arise from the side of the cervix and the lateral fornix of the vagina (fig1). They provide an extensive attachment on the lateral pelvic wall at the level of the ischial spines. Some fibres of the cardinal ligaments interdigitate with fibres from the uterosacral ligaments. This attachment line is known as arcus tendineus fasciae pelvis. The anterior fibres of this ligament continue with lig.pubocervicalis, the posterior fibres continue with lig. Sacrocervicalis. Arteria vaginalis and smooth muscle fibres support this ligament (Ma et al, 2015).

Lig. pubocervicalis; are bilateral structures, which attach the cervix to the posterior surface of the pubic symphysis. This ligament attaches to the bladder. These fibres are known as lig. pubovesicalis.

Lig. Sacrocervicalis; are also bilateral fibrous bands, which attach the cervix to the sacrum. They have a fibromuscular structure. This smooth muscle is recto-uterine muscle. This ligament forms the lateral plicae of excavatio recto uterina (Stoesser, 1955).

Lig.latum uteri (Broad lig.); The Broad ligament is a flat sheet of peritoneum, associated with the uterus, fallopian tubes and ovaries (fig.1). It extends from the lateral pelvic walls on both sides, and folds over the internal female genitalia, covering their surface anteriorly and posteriorly (Aas-Eng et al, 2016).



**Figure 1. Ligamentes of Uterus** (www.Netter imagens.com Anatomy Atlas-4E p.371.).

Anatomically, the Broad ligament can be divided into three regions: Mesometrium surrounds the uterus and is the largest subsection of the Broad ligament. Mesovarium part of the broad ligament associated with the ovaries. Mesosalpinx originates superiorly to the mesovarium, enclosing the fallopian tubes. The connective tissue between two layers of lig. latum uteri is parametrium. Parametrium which surrounds vagina is paracolpium. The serous membrane which covers the uterus is perimetrium (Aas-Eng et al., 2016).

The structures within the Broad ligament are: Parametrium, uterine artery, tuba uterina, lig. teres uteri (lig. rotundum), ovaries and ureter (Langreder, 1958).

Uterine artery; runs into lig. latum uteri from the attachment side of the pelvis, it crosses the ureters superiorly. It anastomoses with the ovarian artery at the origin of the fallopian tubes.

Tuba uterina; they lie in the upper border of the Broad ligament, extending laterally from the uterus

Lig. teres uteri (lig. rotundum); it originates at the uterine horns (the points at which the fallopian tubes enter the uterus), and attaches to the labia majora, passing through the inguinal canal (Langreder, 1958).

Ovarium; oval organs attached to the posterior surface of the Broad ligament of the uterus by the mesovarium (a fold of peritoneum, continuous with the outer surface of the ovaries).

Ureter; cross the pelvic part of the lig. latum uteri in an oblique manner and reaches the bladder.

Plica vesico uterina; a periton plica which connects to the posterior of bladder from the junction of cervix and corpus uteri. This pouch known as excavatio vesico uterina.

Plica recto uterina (Douglas plica); a periton plica which connects to the anterior of rectum from posterior fornix of vagina. This pouch known as excavatio recto-uterina. (Douglas pouch)

Douglas pouch is the deepest place in female pelvis and situated 5cm above the anus. Drainage of Douglas pouch can be performed by an incision of posterior vaginal fornix in clinical practice.

The exact anatomical location of the uterus varies with the degree of distension of the bladder. In the normal adult uterus, it can be described as anteverted with respect to the vagina, and ante flexed with respect to the cervix.

Anteverted: Rotated forward, towards the anterior surface of the body.

Anteflexed: Flexed, towards the anterior surface of the body.

Thus, the uterus normally lies immediately postero superior to the bladder, and anterior to the rectum.

In some individuals, the uterus may not lie in an anteflexed and anteverted position. The three most common dispositions are:

-excessively anteflexed

-anteflexed and retroverted

-retroflexed and retroverted

These abnormal arrangements do not inherently cause any medical problems and infertility. The weakness of these ligaments and muscles cause many problems such as prolapse of uterus. We will discuss this pathology, treatment and conditions associated with prolapse of uterus (Berek and Novak, 2007).

## 2. Desensus Uteri (Uterus Prolapse)

Movement of uterus into the vaginal canal, causing the condition known as a prolapsed uterus. Prolapsed uterus can be described in the following stages:

First degree: The cervix descends down ward into the vagina.

Second degree: The cervix comes down to the opening of the vagina.

Third degree: The cervix is outside the vagina.

Fourth degree: The entire uterus is outside the vagina.

Other conditions usually associated with prolapsed uterus are;

Cystocele: A herniation of the upper front vaginal wall where a part of bladder bulges into the vagina, which may lead to urinary frequency, urgency.

Enterocele: The herniation of the upper vagina along with a segment of small intestine into the vagina.

Rectocele: The protrusion forward of the back wall for the vagina, along with concomitant bulging forward of the rectum into the vagina. This may make bowel movements difficult to the point where the woman may need to push on the inside of the vagina to empty the rectum (Claudia et al, 2012).

The choice of surgery for uterine prolapse depends upon many factors, including the patient's age, and desire for future child bearing. When indicated, and in severe cases of prolapse, the uterus can be removed (hysterectomy). During the procedure, the surgeon can also correct the sagging of the vaginal walls, urethra, bladder, or rectum. (Colpography anterior and posterior) (Berek and Novak, 2007).

Vaginal cuff prolapse; after hysterectomy. Sacrocolpopexy is a surgical technique to repair pelvic organ prolapse. Specifically, it is intended to address apical or vaginal vault prolapse in women. Reconstruction is achieved using an open abdominal technique or with the use of laparoscopy or robotic-assisted surgery. The salient component of reconstruction is suspension of the apical portion of vagina (or the vaginal cuff in patients after hysterectomy) in a manner that recreates the natural anatomic support that the utero sacral and cardinal ligament provide, usually by tacking it to the sacral promontory (Berek and Novak, 2007).

### 3. Results

Today, it is very important to know the structures carrying the uterus in the surgical procedures, prolapse and in the diagnosis which will be applied to the uterus and the surrounding structures in the clinic.

### References

- Aas-Eng M.K, Langebrekke A, Lieng M, Qvigstad E. Management of Broad Ligament Defects and Herniation of Colon. J Minim Invasive Gynecol. 2016 Dec 9. pii: S1553-4650(16)31210-9. doi: 10.1016/j.jmig.2016.12.002.
- Arıncı K, Elhan A. anatomi cilt 1, 2. Baskı 1997 Güneş kitabevi Ankara
- Berek, J. S. Novak, M. Berek and Novak's Gynecology, Pelvic Organ Prolapse, chapter 24. 2007.
- Claudia L. Werner, Debra L. Richardson, Stephanie Y. Chang, William F. Griffith, Cherine A. Hamid, David D. Rahn, Elysia Moschos, Barbara L. Hoffman. Williams Gynecology, 3'e; CHAPTER 24: Pelvic Organ Prolapse, 2012.
- Langreder W. The structure and role of ligamentum rotundum. Geburtshilfe Frauenheilkd. 1958 Apr;18(4):366-73.
- Ma X, Shang S, Xie B, Sun X, Yang X, Wu J, Hong N, Wang J. Study on morphological characteristics of uterosacral and cardinal ligament in patients with severe pelvic organ prolapse based on MRI. Zhonghua fu Chan ke za zhi [2015, 50(9):668-672.
- Stoesser F.G. Construction of a sacrocervical ligament for uterine suspension. Surg Gynecol Obstet. 1955 Nov;101(5):638-41.No. abstract available.
- www.Netter imagens.com Elsevier. Anatomy Atlas-4E p.371. 16 December 2016.