

Case Report

Innominate uteroumbilical ligament: a rare support of uterus

Kamal Singh*, Piyush Kumar, Aarti Rohilla, Namrata Katoch, Kamalpreet Kaur

Department of Anatomy, Pt. B. D. Sharma PGIMS, Rohtak, Haryana, India

Received: 06 December 2017

Accepted: 30 December 2017

*Correspondence:

Dr. Kamal Singh,

E-mail: drkamalanatomy@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

The ligaments along with the pelvic floor muscles are important supports of uterus and are supposed to help in maintaining the normal positioning of the uterus and prevent its prolapse. In present case report an unknown uteroumbilical ligament have been found extending from the uterus to the anterior abdominal wall of a female cadaver during the dissection. The ligament provides extra support to the uterus. It would have presumably helped in preventing uterine prolapse and retroversion of uterus. Such kind of structures around uterus and other pelvic organs when go unnoticed may complicate pregnancies and pose risk to life during surgeries. Thus, present case report will help in enhancing our knowledge related to gross anatomy as well as it will further enrich the literature data.

Keywords: Ligament, Uterus, Umbilical

INTRODUCTION

The incidence of urogenital tract anomalies is less reported as many of these defects go undetected during a woman's lifetime or may be due to inaccurate diagnosis.

Etiology of these anomalies may be an insult during the first trimester, such as exposure to sex steroids, or may be due to polygenic/multifactorial inheritance. Most cases, however, are caused by an unknown problem during foetal development.¹ Ligaments associated with uterus are divided into true and false ligaments.

True ligaments are paired fibromuscular bands, and these are: Round ligaments of uterus, Mackenrod's ligaments, uterosacral ligaments and pubocervical ligaments. False ligaments are peritoneal folds and are: uterovesical fold, rectovaginal fold, a pair of rectouterine folds and the broad ligaments of uterus. These ligaments are supposed to be the supports of uterus either directly or indirectly. They maintain the normal positioning of the uterus and prevent its prolapse.²

Embryology

In the presence of estrogen and the absence of testosterone and antimullerian hormone, paramesonephric ducts develop into the main genital ducts of the female. With descent of the ovary, the cranial part of these paramesonephric (mullerian) ducts develop into the uterine tube, and the caudal parts of both sides fuse in the midline to form the utero-vaginal canal.³

The epithelium of the uterus develops from the fused paramesonephric ducts (utero-vaginal canal).

The myometrium is derived from surrounding mesoderm. As the thickness of the myometrium increases, the unfused horizontal parts of the two paramesonephric ducts come to be partially embedded within its substance, and help to form the fundus of the uterus.

The cervix can soon be recognized as a separate region. In the fetus the cervical part is larger than the body of the uterus.⁴

CASE REPORT

In the course of routine dissection of a female cadaver while teaching undergraduates in the Department of Anatomy, PGIMS, Rohtak, an innominate ligament from fundus of uterus to anterior abdominal wall was seen. This ligament was further studied for the different parameters i.e. total length, breadth at different points and thickness at those points (Figure 1). Uterus of the cadaver was also studied in-situ and after taking out from the cadaver for its normal anatomy. The uterus was found to be normal in size, shape and position (Figure 2).

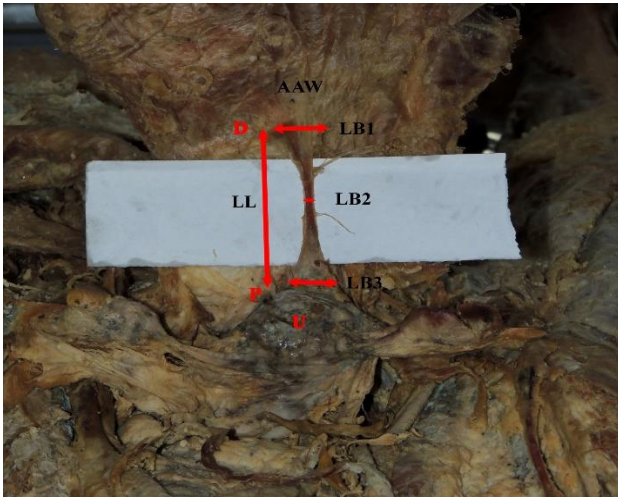


Figure 1: Showing Innominate Uteroumbilical Ligament (AL) extending from base (B) at Uterus (U) to apex (A) at Anterior Abdominal Wall (AAW) which has Total Length (LL); Breadth at apex (LB1), at the narrowest point (LB2), at base (LB3).

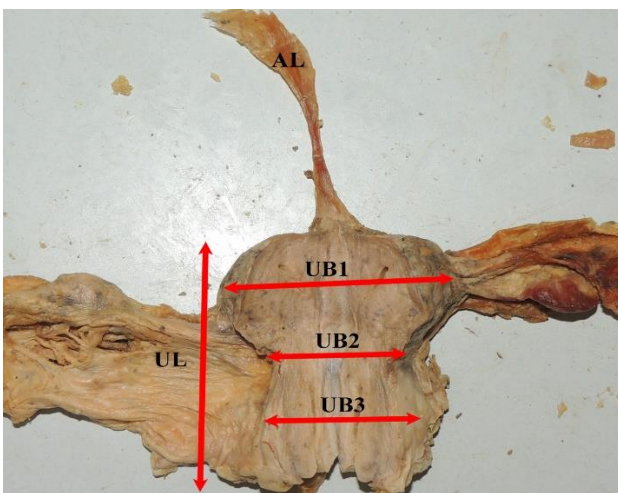


Figure 2: Showing Dissected Specimen of Uterus with Innominate Uteroumbilical Ligament (AL) with various parameters of uterus as Total Length (UL); Breadth at Fundus (UB1), at midpoint of body (UB2), the midpoint of cervix (UB3).

All the measurements were taken using digital vernier callipers with least count 0.01 mm and photograph of the specimen was taken using Cannon 700D DSLR camera mounted with 18-55 mm focal length lenses.

Case findings

On gross examination findings

On dissection a midline ligamentous structure was seen whose proximal end (P) was merging with the uterine fundus and the distal end (D) attached with the anterior abdominal wall, just inferior to the umbilicus. Ligament was biconcave in shape with widened proximal and distal ends and a narrow middle part. Ligament was thickest at proximal end and gradually thinned out distally and again thickened gradually to finally get its attachment to the anterior abdominal wall. Different morphometric measurements of the uteroumbilical ligament taken were as follows (as depicted in Figure 1):

- Total Length of ligament from proximal to distal end(LL):8.06cm.
- Breadth: at distal end (LB1): 1.7cm; at the narrowest point (LB2): 0.35 cm; and at proximal end (LB3): 1.33cm.
- Thickness: at distal end (LT1): 1.42mm; at the narrowest point (LT2): 1.02mm; and at proximal end (LT3): 2.16mm.
- Uterus was found normal in size, shape and position. Dimensions of the dissected specimen of uterus were as follows (as depicted in Figure 2):
- Total Length of uterus (UL): 7.43cm.
- Breadth: at fundus (UB1): 5.02cm; at midpoint of body (UB2): 2.82cm; and at the midpoint of cervix (UB3): 3.76 cm.
- Thickness: at fundus UT1: 3.04 cm, at midpoint of body (UT2): 1.64cm and at midpoint of cervix (UT3): 2.38cm.

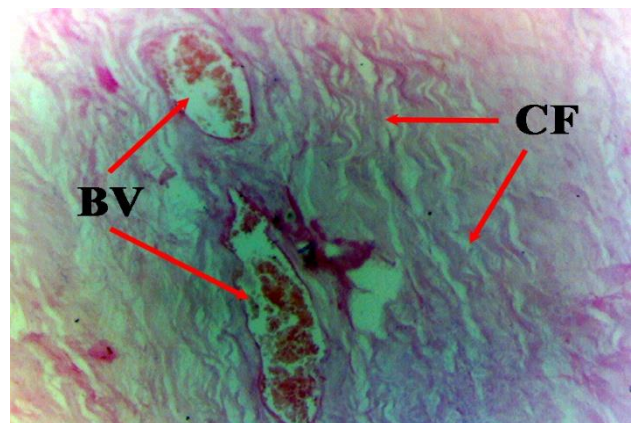


Figure 3: Histological picture (magnification) showing regularly arranged parallel running abundant collagen fibers (CF), with large blood vessels (BV) full of RBC's.

Moreover, there was no skin incision found on anterior abdominal wall, so as to rule out any kind of pathological, postoperative or post-inflammatory adhesion we have done the histological examination after making sections, stained with H and E, and observed the slide under Trinocular microscope with magnification (10X objective lens) and picture was captures with image analyser software Capture Pro 4.2.

Histological findings

Histological picture (Figure 3) showed that the ligament is made up of dense regular connective tissue with abundant collagen fibers (CF) regularly arranged as parallel bundles, with large blood vessels (BV) full of RBC's.

DISCUSSION

Normal development of the Mullerian ducts depends on the completion of three phases: organogenesis, fusion and septal resorption. Organogenesis is characterized by the formation of both Mullerian ducts. Failure of this results in uterine agenesis/hypoplasia or a unicornuate uterus. Fusion is characterized by fusion of the ducts to form the uterus. Failure of this results in a bicornuate or didelphys uterus. Septal resorption involves subsequent resorption of the central septum once the ducts have fused. Defects in this stage result in a septate or arcuate uterus.⁵ Absence of any scar mark on the skin of the anterior abdominal wall, as well as histological findings disproves the possibility of this innominate uteroumbilical ligament being a post-operative adhesion. There was no evidence of diffuse inflammatory adhesions observed while dissecting the pelvis. The structure in question is a localized tissue with well-defined margins, borders and attachments which is histologically confirmed to be a dense regular connective tissue made up of regularly arranged collagen fibers with rich vascularity. The anomaly found by us in cadaveric dissection cannot be placed in any of the classification system till now. Classification regarding such anomalous structures best available is as shown in Table 1.

Table 1: AFS classification of müllerian duct anomalies.⁶

Classification	Anomaly
Class I	(agenesis/hypoplasia)
Class II	(unicornuate)
Class III	(didelphys)
Class IV	(bicornuate)
Class V	(septate)
Class VI	(arcuate)
Class VII	(des related)

Our best theory to explain such ligamentous attachment of Uterus to anterior abdominal wall is derived from the

fact that anterior abdominal wall develops from ectoderm and somatopleuric mesoderm whereas myometrium of the uterus develops from intermediate mesoderm around mullerian duct. Due to lateral folding of embryo ectoderm and somatopleuric mesoderm extends ventrally and comes to lie anteriorly to the intermediate mesoderm. An anomalous connection between both this mesoderm i.e. somatopleuric mesoderm and mesoderm around mullerian duct may lead to the ligamentous structure encountered by us.

Moreover, because of non-availability of any kind of literature similar to our finding it becomes very difficult to compare and discuss it further. However, this Uteroumbilical ligament could be added in the supports of uterus for further elaboration in future. Such kind of structures around uterus and other pelvic organs when go unnoticed may complicate pregnancies and pose risk to life during surgeries.

CONCLUSION

The ligament found in our case provides extra anchorage to the uterus and will help in preventing uterine prolapse and retroversion of uterus by providing extra support. The present case report will help in enhancing our knowledge related to gross anatomy as well as will further enrich the literature data.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

- Zurawin RK, Dietrich JE, Heard MJ, Edwards CL. Didelphic uterus and obstructed hemivagina with renal agenesis: Case report and review of the literature. *J Pediatr Adolesc Gynecol.* 2004;17:137-41.
- Arya LA, Schwartz N. Female reproductive system. In: Standring S (ed) *Grays Anatomy-The Anatomical Basis of Clinical Practice*, 41st ed. Elsevier, London, 2016;1295-7.
- Sadler TW. Urogenital system. In: Taylor C (ed) *Langman's Medical Embryology*. 13th ed. Wolters Kluwer Health, Philadelphia, 2015;266.
- Singh IB, Pal GP. Urogenital system. In: Beri R (ed) *Human embryology*. 8th ed. Macmillan publishers, New Delhi. 2007;251.
- Chandler TM, Machan LS, Cooperberg PL, Harris AC, Chang SD. Mullerian duct anomalies: from diagnosis to intervention. *Br J Radiol.* 2009;82:1034-1042.
- Develi S. Female genital system. In: Tubbs RS, Shoja MM, Loukas M, (eds) *Bergman's comprehensive encyclopedia of human anatomic variations*. Wiley Blackwell, New Jersey, 2016:1368-71.

Cite this article as: Singh K, Kumar P, Rohilla A, Katoch N, Kaur K. Innominate uteroumbilical ligament: a rare support of uterus. *Int J Res Med Sci* 2018;6:723-5.