IAMJ

INTERNATIONAL AYURVEDIC MEDICAL JOURNAL

Review Article ISSN: 2320-5091 Impact Factor: 6.719

A BRIEF STUDY ON THE CLINICAL ANATOMY OF PELVIC VISCERA

Shaifali Sharma[1], Harvendra Devpal[2], Dinesh Kumar Sharma[3]

[1]P.G. Scholar, P.G. Department of Rachana Sharir, M.M.M. Government Ayurveda College, Udaipur, Rajasthan
[2]P.G. Scholar, P.G. Department of Rachana Sharir, M.M.M. Government Ayurveda College, Udaipur, Rajasthan.
[3]Lecturer, P.G. Department of Rachana Sharir, M.M.M. Government Ayurveda College, Udaipur, Rajasthan.

Corresponding Author: sharmashaifali44@gmail.com

https://doi.org/10.46607/iamj05p7022023

(Published Online: January 2023)

Open Access

Article Received: 07/01/2022 - **Peer Reviewed:** 29/01/2023 - **Accepted for Publication:** 20/02/2023.

Check for updates

ABSTRACT

Ayurveda describes the *Sharir* and *Shareera* in a very enumerative way. In the definition of *Sharir*, *Acharya Sushruta* says that when a fully developed foetus with all its body parts and the sense organs is called *Sharir*. He has mentioned the "*Nitambaadi*" (buttocks etc.) word in it, which means he has specially mentioned the pelvic viscera or organs along with the other organs of the body. *Acharya Sushruta* considered some pelvic viscera as *Pratyanga* (different parts of the body) like the *Basti* (urinary bladder), *Vankshan* (inguinal area), *Vrishan* (testes), and *Sphik* (buttocks).

The pelvis is the region of the trunk that lies below the abdomen. The bony pelvis's main function is to transmit the weight of the body from the vertebral column to the femurs and it also supports and protects the pelvic viscera. The bony pelvis is composed of the two hip bones (which make the anterior and lateral walls), the sacrum, and the coccyx (which forms the back wall). The bony pelvis forms a strong basin-shaped structure that contains as well as protects the pelvic viscera-like lower parts of the intestinal, urinary tracts, and the internal organs of reproduction. Many diseases and complications originate from any trauma or any other structural changing in their actual anatomical structure. This paper focuses primarily on the clinical anatomy related to pelvic viscera.

Key words: *Basti*, *Nitambaadi*, Pelvis, *Pratyanga*.

INTRODUCTION

The pelvis is divided into two parts the pelvic brim (formed by sacral promontory) behind, the iliopectineal lines laterally, and the symphysis pubis anteriorly. Above the brim is the false pelvis, which forms

part of the abdominal cavity. Below the brim is the true pelvis.

False Pelvis: The false pelvis is bounded behind by the lumber vertebrae, laterally by the iliac fossae and iliacus muscle, and in front by the lower part of the anterior abdominal wall. Although the false pelvis is of little clinical importance, it supports the abdominal contents and after the third month of pregnancy, it helps and supports the gravid uterus during the early stages of labor. It helps guide the foetus into the true pelvis.

True Pelvis: It is the bony canal through which the child passes during birth. The true pelvis has an inlet/pelvic brim, an outlet, and a cavity. The pelvic cavity lies between the inlet and the outlet. It is a short and curved canal with a shallow anterior wall and a much deeper posterior wall. The walls of the pelvis are formed by bones and ligaments; these are partly lined with muscles like the obturator internus, and piriformis covered with fascia and parietal peritoneum.

Pelvic Viscera in Males:

In the posterior part of the pelvic cavity: Rectum**,** Sigmoid colon**,** Terminal coils of the ileum**.**

In the anterior part of the pelvic cavity: Ureters**,** Urinary bladder**,** Male genital organs like Testes, epididymis, vasdeferens, seminal vesicles, ejaculatory ducts, prostate, prostatic urethra.

Pelvic Viscera in Females:

In the posterior part of the pelvic cavity: Rectum**,** Sigmoid colon/ Pelvic colon**,** Terminal coils of the ileum**.**

In the anterior part of the pelvic cavity: Ureters, Urinary bladder, Urethra, and female genital organs like the ovary, fallopian tubes, uterus, and vagina.

A little bit about the Pelvic Viscera:

Ureters: The ureter enters the pelvis by crossing the bifurcation of the common iliac artery in front of the sacroiliac joint. Then it runs down the lateral wall of the pelvis in front of the internal iliac artery to the region of the ischial spine and turns forward to enter the lateral angle of the bladder. The ureter possesses three constrictions where the renal pelvis joins the ureter in the abdomen. Where it is kinked as it crosses the pelvic brim to enter the pelvis and where it pierces the urinary bladder wall. [1]

Urinary Bladder: The urinary bladder is situated immediately behind the public organs within the pelvis. The bladder has a strong muscular wall. Its shape and relations vary according to the amount of urine that it contains. The empty bladder in the adult lies entirely within the pelvis, as the bladder fills; its superior wall rises up into the hypogastric region. In the young child, the empty bladder projects above the pelvic inlet, later when the pelvic cavity enlarges, the bladder sinks into the pelvis to take up the adult position.

Urethra: It is a membranous canal for the external discharge of urine and seminal fluid in the male. It is 18 to 20 cm long, divided into a membranous part (1.5-2 cm long), a prostatic part (3 cm), and a spongy/penile part (15 cm). It is about 4 cm long in females.

Sigmoid colon / pelvic colon: The sigmoid colon is 10-15 inches long and begins as a continuation of the descending colon in front of the pelvic brim. Below, it becomes continuous with the rectum in front of the S_3 vertebra. It is mobile and hangs down into the pelvic cavity in the form of a loop. It is attached to the posterior pelvic wall by the sigmoid mesocolon.

Rectum: The rectum is about 5 inches long and begins in front of the third sacral vertebra. It passes downward, following the curve of the sacrum and coccyx, and ends in front of the tip of the coccyx by piercing the pelvic diaphragm.

Testes: The testis is a firm, mobile organ lying within the scrotum. The test usually lies at a lower level than the right. The upper pole of the gland is tilted slightly forward. Each testis is surrounded by a tough fibrous capsule, the tunica albuginea. The testis develops high up on the posterior abdominal wall, and in late fetal life, it descends behind the peritoneum. The tunica vaginalis layer lies within the spermatic fasciae of the scrotum and covers the anterior, medial, and lateral surfaces of each testis.

Epididymis: It is a firm structure lying posterior to the testis, with the vas deferens lying on its medial side. The epididymis is a much-coiled tube that

emerges from the tail of the epididymis as the vas deferens, which enter the spermatic cord. The terminal part of the vas deferens becomes dilated and is known as the ampulla. The inferior end of the ampulla narrows down and joins the duct of the seminal vesicle to form the ejaculatory duct.

The testicular artery (branch of the abdominal aorta) supplies the testes. The testicular veins emerge from the testis and epididymis as a venous network, the pampiniform plexus. This becomes reduced to a single vein as it ascends through the inguinal canal.

Seminal vesicle: The seminal vesicles lie on the posterior surface of the bladder. Each seminal vesicle narrows and joins the vas deferens on the same side to form the ejaculatory duct.

Prostate: The prostate is incompletely divided into five lobes. The anterior lobe lies in front of the urethra and is devoid of glandular tissue. The median or middle lobe is situated between the urethra and ejaculatory ducts. The posterior lobe is situated behind the urethra and below the ejaculatory ducts. The right and left lateral lobes lie on either side of the urethra. The median, posterior, and lateral lobes are rich in glandular tissue. The normal glandular activity of the prostate is controlled by the androgens and estrogens circulating in the bloodstream. The secretions of the prostate are poured into the urethra during ejaculation and are added to the seminal fluid. Acid phosphatase is an important enzyme present in secretion. In the carcinoma of the prostate, the serum acid phosphatase level of the blood rises because the glandular cells producing this enzyme can't discharge their secretion into the ducts.

Ovary: The ovary is attached to the back of the broad ligament by the mesovarium. The part of the broad ligament extending between the attachment of the mesovarium and the lateral wall of the pelvis is called the suspensory ligament of the ovary. The ovary is kept in position by the broad ligament and the mesovarium. After pregnancy the broad ligament is lax, and the ovaries may prolapse into the rectouterine pouch (pouch of Douglas). In these circumstances, the ovary may be tender and can cause dyspareunia.

Uterine tubes (fallopian tubes): The uterine tube is divided into the infundibulum (with many fingerlike processes known as fimbriae), the ampulla (widest part), the isthmus (narrowest part), and the intramural part.

Uterus: The uterus is a hollow organ with thick muscular walls. The fundus is the part that lies above the entrance of the uterine tubes. The body is the part that lies below the entrance of the uterine tubes. It narrows below and becomes continuous with the cervix. The cervix pierces the anterior wall of the vagina and is divided into the supra-vaginal and vaginal parts of the cervix. The cavity of the cervix (the cervical canal) communicates with the cavity of the body through the internal o_s and with that of the vagina through the external O_s.

Vagina: The upper half of the vagina lies above the pelvic floor and the lower half lies within the perineum. The area of the vaginal lumen which surrounds the cervix is divided into four regions or fornices, anterior, posterior, right lateral, and left lateral. [2]

MATERIAL AND METHOD:

This paper is based on various Ayurvedic texts such as Sushrut Samhita. The various books on general anatomy and clinical anatomy also referred to collect the relevant data /sort of information regarding this topic.

DISCUSSION

Clinical Anatomy of the organs related to the excretory system: Ureteric calculi: stones may be arrested at the anatomical narrowing namely the pelviurethral junction, the pelvic brim, and where the ureter enters the bladder. **Bladder distension:** in this case urine can be drained up to 1000 -1200 ml through a catheter (normal capacity - 500 ml). **Bladder injuries:** may be ruptured intraperitonially or extraperitoneal. Intraperitoneal rupture usually involves the superior wall of the bladder, commonly occurs during full bladder, and extended up into the abdomen. Extraperitoneal rupture involves the anterior part of the bladder wall and commonly occurs in fractures of the pelvis when bony fragments pierce the bladder wall. In young children, the bladder is an

abdominal organ, so abdominal trauma can injure the empty bladder. **Difficulty with micturition after spinal cord injury:** After injuries to the spinal cord, the nervous control of micturition is disrupted. The normal bladder is innervated by sympathetic outflow (L1, and L2 segments of the spinal cord). The sympathetic nerves inhibit the contraction of the detrusor. The bladder is also innervated by parasympathetic outflow (S2- S4 segments of the spinal cord). The parasympathetic nerves stimulate the contraction of the detrusor. Disruption of the micturition process by spinal cord injuries produces the **atonic bladder** (occurs during spinal shock), in this situation bladder wall muscle is relaxed, sphincter vesicae contracted, sphincter vesicae relaxed, the bladder becomes greatly distended and finally overflows. Spinal cord injuries also produce the **automatic reflex bladder** (which occurs after the recovery from spinal shock). It is found normally in infancy. Stretch receptors in the bladder wall are stimulated as the bladder fills, and the afferent impulses pass to the S2, S3, and S4 segments of the spinal cord. Efferent impulses pass down to the bladder muscle which contracts, and the sphincter vesicae and the urethral sphincter both relax. The **autonomous bladder** occurs if the sacral segments of the spinal cord are destroyed. The bladder wall becomes flaccid, capacity is greatly increased and merely fills to capacity and overflows, and continual dribbling is the result. **Rupture of the urethra:** Commonly ruptured beneath the pubis by a fall, **Urethritis, Stricture of the urethra, Hypospadias:** an anomaly in which the urethra opens on the undersurface of the penis or perineum. **Epispadias** is a rare condition in which the urethra opens on the dorsum of the penis.

Clinical Anatomy of the organs related to the digestive system: Hirschsprung disease: Abdomen becomes distended. The sigmoid colon is greatly distended, and hypertrophied, while the rectum and anal canal are constricted. It is the constricted segment of the bowel that causes the obstruction; the child fails to pass meconium during the first few days after birth. **Cancer of sigmoid colon**: lymphatic vessels of this segment of the colon drain into the inferior mesenteric nodes so it is a common site for cancer of the large bowel. **Volvulus:** Sigmoid colon rotates sometimes around its mesentery. This may correct spontaneously if it fails to do so it is known as volvulus (counterclockwise rotation). **Diverticula:** Diverticula of mucous membrane along the course of the arteries supplying the sigmoid colon. In patients with diverticulitis, the sigmoid colon may be adherent to the bladder, rectum, ileum, and ureter and produces an internal fistula. **Internal hemorrhoids:** inferior mesenteric artery continues to form the superior rectal artery. The internal hemorrhoids are arranged in three groups the superior rectal artery and veins are arranged. **Rectal prolapse, Rectal carcinoma, Neurological disturbance of rectum** (peripheral nervous plexus controls the automatic evacuation of the rectum after sacral denervation)

Clinical Anatomy of the organs related to the reproductive system: Varicocele (elongated and dilated veins of pampiniform plexus, mostly at the left side in young adults because the right testicular vein joins the low-pressure inferior vena cava and left testicular vein joins the left renal vein in which the venous pressure is higher), **Malignant tumor of the testis** (spreads upward via lymph vessels to the lumber lymph nodes), **Torsion of the testis** (rotation of testis around the spermatic cord), **Hydrocele** (accumulation of fluid within the tunica vaginalis), **Anterior inversion** (testis and tunica vaginalis lie posteriorly and epididymis lies posteriorly while the testis and epididymis are completely inverted in polar inversion). **Cryptorchidism / incomplete descent of the testis**.

Benign prostatic hyperplasia/ benign enlargement of the prostate (occurs after 50 years of age, median lobe enlarges upward), **Prostate cancer** (prostatic venous plexus connects with the vertebral veins. During sneezing/coughing/abdominal straining the strong possibility is that prostatic venous blood flow in the reverse direction and enters the vertebral veins, this explains the skeletal metastases), **Prostatitis.**

Cysts of the ovary: Developmental arrest of the ovarian follicle, **Follicular cysts, and luteal cysts** (originate in unruptured graafian follicles and cysts in

corpus luteum), **Ovarian prolapse, Ovarian dysgenesis** (complete failure in development in turner syndrome), **Imperfect descent of the ovary into the pelvis.**

Pelvic inflammatory disease (the organism enters the body through intercourse and ascends through the uterus and enters the uterine tubes). **Salpingitis** (inflammation of uterine tube), **Sterility** (inability to have a child mainly due to tubal blockage), **Tubal pregnancy** (A type of ectopic pregnancy, in this condition the fertilized ovum adheres to the walls of the uterine tube), **Prolapse of the uterus, Agenesis of the uterus** (absence of uterus as the result of the failure of the paramesonephric ducts to develop), **Infantile uterus** (much smaller uterus resembles that present before puberty, amenorrhea is present, but vagina, ovaries may be normal), **Failure of fusion of the paramesonephric ducts** may cause duplicated uterus with two bodies and two cervices, with a complete septum through the uterus, making two uterine cavities and two cervices, there may be two separate uterine bodies with one cervix. One paramesonephric duct may fail to develop, leaving one uterine tube and half of the body of the uterus.

Prolapse of the vagina: prolapse of the uterus is associated with some degree of sagging of the vaginal walls. Sagging of the bladder results in the bulging of the anterior wall of the vagina, this is known as **a cystocele.** When the ampulla of the rectum sags against the posterior vaginal wall, the bulge is called a **rectocele. Vaginal agenesis:** The wall of the urogenital sinus fails to form the vaginal plate because of the failure of the development of paramesonephric ducts, so there is an absence of the vagina, uterus, and uterine tubes. **Double vagina**: caused by incomplete canalization of the vaginal plate. **Imperforate vagina and imperforate hymen:** caused by a failure of the cells to degenerate in the center of the vaginal plates and the imperforate hymen is caused by a failure of the cells of the lower part of the vaginal plate and wall of the urogenital sinus to degenerate. These conditions lead to retention of the menstrual flow, a clinical condition called hematocolpos. [3]

CONCLUSION

When Ayurvedic science defines the Shadanga Sharir, it includes the pelvic cavity into the Adho Shakha. There is no separate division of the pelvic cavity like the thoracic and abdominal cavities have (Madhyam Sharir). But many diseases regarding this are finely defined by Ayurvedic science. Modern science has described well the anatomy of the pelvis, and pelvic viscera as well as clinical anatomy regarding these. The most sensitive organs of the three systems are among all systems included in pelvic viscera. Ayurveda shows the importance of some of the pelvic viscera by saying that Guda is the Dashmoola and Basti is the Uttama Pranaytana as well as included in Trimarma. As we know that all the reproductive organs, the principal organs of the excretory system, and some other major organs of the digestive system like the rectum, sigmoid colon, and terminal part of the ilium come under the pelvic viscera. Pathologies affecting these organs may cause permanent or temporary disability in major and main functions like conception and evacuation. So, it is too much important to study pelvic viscera with these clinical pathologies.

REFERENCES

1. B D Chourasia's Kidney and Ureter the ureters Dr. Krishna Garg HUMAN ANATOMY 4th edition, New delhi CBS Publishers and Distributors Pvt. Ltd., 2004, P.NO. 301.
2. Richard S. Snell the Pelvis: Part I the Pelvic walls Lippincott Williams and Wilkins CLINICAL ANATOMY BY REGIONS 9th edition, new delhi Wolters Kluwer (india) Pvt. Ltd., 2016, P.NO. 241.
3. Richard S. Snell the Pelvis: Part II the Pelvic cavity Lippincott Williams and Wilkins CLINICAL ANATOMY BY REGIONS 7th edition, new delhi Wolters Kluwer (india) Pvt. Ltd., 2004, P.NO. 361.

Source of Support: Nil
Conflict of Interest: None Declared

How to cite this URL:Shaifali Sharma et al: A Brief Study on the Clinical Anatomy of Pelvic Viscera. International Ayurvedic Medical Journal {online} 2023 {cited January 2023} Available from: http://www.iamj.in/posts/images/upload/137_141.pdf