VAGINA AND VULVA

VAGINA

I. INTRODUCTION

The vagina is a distensible fibromuscular tube in the midline of the pelvic floor and pelvic cavity. It belongs to the female internal genital organs and constitutes the copulatory organ in women and the main support system of the pelvic organs.

II. DESCRIPTIVE ANATOMY

A- SITUATION AND ORIENTATION

The vagina lies in approximately the same direction as the pelvic brim crossing, backwards, the vertebra S3 and forming with the horizontal an angle of fifty degrees in decubitus position and thirty degrees in standing position and with the axis of the cervix an angle of ninety degrees.

The anterior and posterior walls are in opposition concave backwards forming the vaginal angle of one hundred forty degrees at rest, this angle decreases within abdominal thrusts and increases within the contraction of levator ani muscle.

The lumen is transverse and the vaginal orifice is an anteroposterior slit.

The vagina extends from the uterine cervix to the labia minora of the pudendal cleft of the vulva.

It lies in front of the rectum, anal canal and perineal body, and behind the bladder and urethra.

B- DIMENSIONS

The total length of the vagina is ten centimetres. Its walls length are respectively seven for the anterior and nine for the posterior wall.

The vaginal canal is normally collapsed so that the anterior wall is in contact with the posterior wall, its diameter increases from the vaginal orifice to the fornix. Thus, it has a very important compliance that decreases after menopause.

C- SHAPE

In the state of emptiness, the vagina is flattened anteroposteriorly and has two faces, anterior and posterior, two lateral borders and two ends, the lower end constitutes the vestibule of the vagina whose boundary is labia minora and the upper end is slightly expanded and receives the uterine cervix which projects into it forming round the margin of the cervix a circular groove, the vaginal fornix.

III. STRUCTURE

The vaginal wall is a four layers wall.

The outer layer is the adventitia, the vaginal fascia, and is made of fibrous tissue continuous with the pelvic fascia, except at the posterior fornix which has a peritoneal covering.

The smooth muscle fibres are arranged mainly longitudinally, and at the lower end blend with the skeletal fibres of pubovaginalis and bulbospongiosus and contains two thickenings in each wall, the anterior and posterior columns of the vagina.

The erectile body of the vagina consists of lax connective tissue rich in elastic fibres and venous plexuses and is particularly thick in the anterior column of the vagina and its bifurcation.

The mucosa is a stratified squamous non-keratinizing epithelium overlying a connective tissue lamina propria, on macroscopic aspect two longitudinal ridges are seen called the columns of the vagina and from them numerous transverse ridges extend outward on either side. The anterior column of the vagina and its bifurcation is the most erogenous zone of the body.

IV. SUPPORTS

The vagina constitutes the support system of pelvic organs. Therefore, it is fixed in each part of it.

In its anterior and posterior faces, it is fixed to the urinary bladder and urethra in front and to the rectum at the back by the vesicouterine and rectouterine pouches.

In its lower end, the one layer of longitudinal muscle of the vaginal wall blend with the skeletal fibres of pubovaginalis and bulbospongiosus and is fixed to the perineal body by the perineal membrane.

In its upper end, the vault of the vagina is fixed to the cervix and, thus, fixed by the uterosacral ligament and the lateral ligament.

In its lateral borders, the vaginal fascia blend with the fascia of levator ani muscle.

These supports transmit the contraction of levator ani muscle and the abdominal thrusts to the vagina and modify its angle.

V. ANATOMICAL RELATIONS

The vagina is a pelvic and perineal organ, thus its anatomical relations are disposed in two levels, pelvic and perineal.

Below the cervix, the anterior wall of the vagina is in contact with the base of the bladder and the retrovesical portion of the pelvic ureter, and below the bladder, the urethra is embedded in the vaginal wall through the vesicouterine pouch.

The posterior wall lies in front of the rectum, anal canal and perineal body, the posterior fornix is covered by peritoneum of the front of the rectouterine pouch of Douglas.

The pelvic part of the lateral borders is fixed by the lateral ligament made of the parameter and the paracervix and their vessels and nerves separated by the ureter at fifteen millimetres from the vaginal fornix.

The perineal part of the lateral borders starts at the level of pubovaginalis muscles of levator ani and passes down through the urogenital diaphragm and perineal membrane, the deep perineal space, into the superficial perineal space to become the vestibule of the vagina showing internally the remains of the hymen, lateral to the vestibule is the bulb of the vestibule covered by the bulbospongiosus muscle.

VI. BLOOD SUPPLY; LYMPH DRAINAGE AND NERVE SUPPLY

A- ARTERIES

The vaginal branch of the internal iliac artery is an obvious supply, but other sources include the uterine by its vesico-vaginal and cervico-vaginal branches, inferior vesical and middle rectal vessels, whose branches all make good anastomotic connexions on the vaginal wall forming the azygos arteries of vagina, the anterior is more developed.

The vaginal arteries are in contact, during their course, with the posteromedial border of the ureter and cross it, backwards, at the level of the uterine coil. Many anatomical variations are possible, mainly, concerning its origin.

B- VEINS

Veins correspond to arteries; they join the plexuses on the pelvic floor to drain into the internal iliac vein.

C- LYMPH DRAINAGE

The lymphatics of the vagina, like those of the cervix, drain to external and internal iliac and sacral nodes, but the lowest part (below the hymen level) drains like other perineal structures to superficial inguinal nodes.

D- NERVES

The lower end of the vagina receives sensory fibres from the perineal and posterior labial branches of the pudendal nerve, and (with the anterior part of the vulva) from the ilioinguinal nerve. Sympathetic fibres from the hypogastric plexuses supply blood vessels and the smooth muscle of the vaginal wall. The upper vagina is said to be sensitive only to stretch, the afferent fibres running with sympathetic nerves.

VULVA

I. INTRODUCTION

The female external genital organs constitute the vulva. The vulva extends from the perineal skin to the perineal membrane of the urogenital diaphragm and occupies, mainly, the superficical perineal space. It includes the mons pubis, labia majora, labia minora, clitoris, vestibule of the vagina, bulb of the vestibule and the greater vestibular glands. (Figure 1)

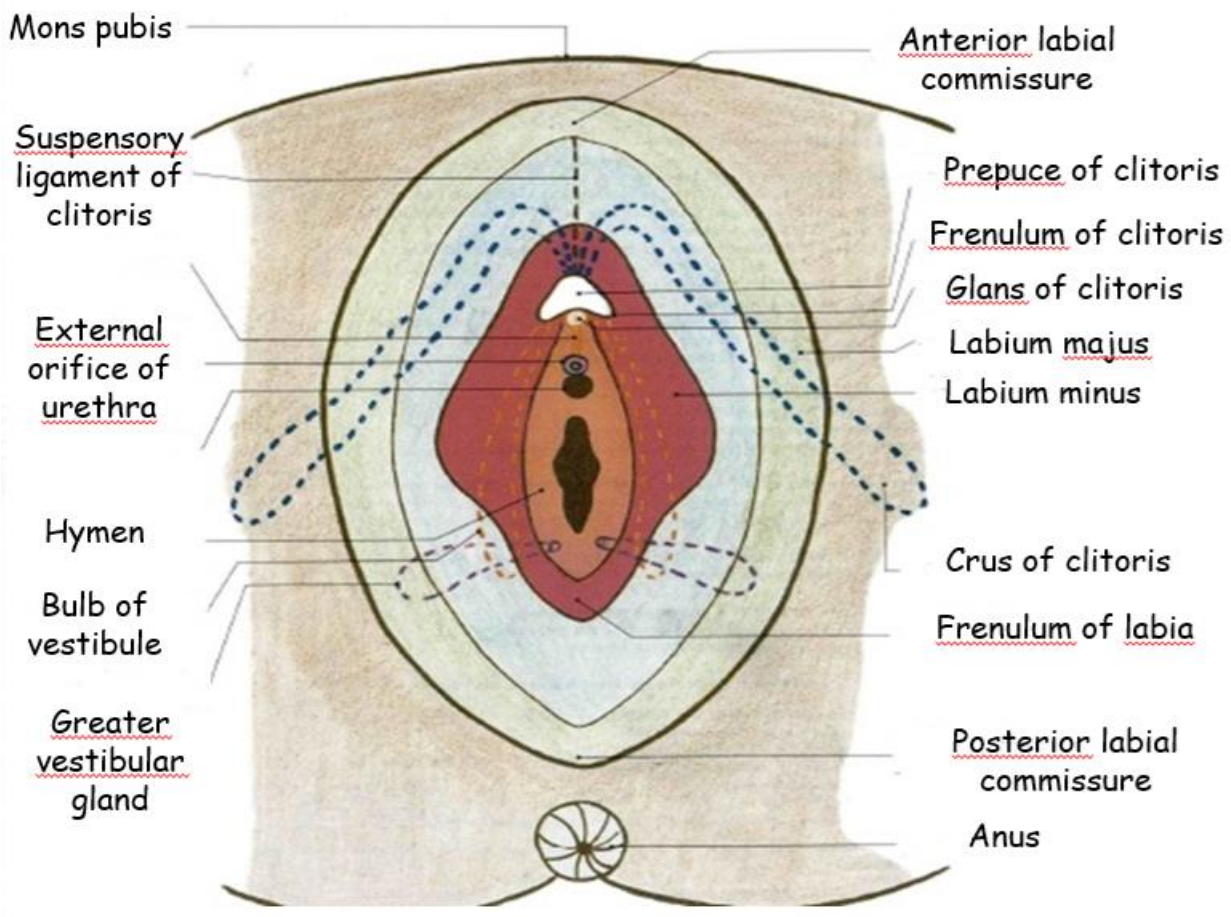

Figure 1: Anterior view of female urogenital region

II. DESCRIPTIVE ANATOMY

All the formations and structures seen in the male are present in the female, but greatly modified for functional reasons.

Labia majora consists of fatty cutaneous folds rich in vessels forming the boundary of the pudendal cleft joined in front as the anterior commissure; at the back they fade away approaching the anus behind the vagina, and this area forms the posterior commissure, the round ligaments of the uterus end in the front of each labium. It is eight centimetres long, one and half thick and two centimetres and half high. Each labium majus has two faces; lateral convex separated from the medial face of the thigh by the genitofemoral sulcus and medial flat and hairless separated from the labium minus by the interlabial sulcus; two borders; anterior free limiting the pudendal cleft and posterior adhering to the pubic branches.

Labia minora consists of cutaneous folds without fat mucous in appearance and hairless lying internal to the labia majora and forming the boundaries of the vestibule of the vagina, their front ends split to form the (dorsal) prepuce and (ventral) frenulum of the clitoris, while at the back they unite by a small skin fold, the frenulum of the labia. It is four centimetres long, four millimetres thick and one millimetre and half high. Each labium minus has two faces; lateral labial and medial vestibular; two borders; anterior free limiting the vestibule of vagina and posterior adhering to the bulb of vestibule.

The vestibule of the vagina is a seven centimetres deep space bounded by the labia minora and contains the external urethral meatus, the vaginal orifice and the ducts of the greater vestibular glands of Bartholin.

The external urethral meatus is a 4 mm of diameter triangular orifice in the vestibule of the vagina in front of the vaginal orifice and two centimetres and half behind the clitoris. On each side at five and seven o'clock opens the ostium of the paraurethral glands, Skene's glands.

The vaginal orifice is an anteroposterior slit thirteen centimetres from the S1 vertebra closed by the hymen; a mucosal fold of variable extent and thickness at the margins; may be absent or may even completely close the opening and its remains after rupture by the first sexual intercourse may form small tags, the hymenal carunculae. On each side at five and seven o'clock opens the ostium of the greater vestibular glands of Bartholin.

The clitoris is the female sexual organ and is, morphologically, equivalent to the penis and, thus, has a root, body and glans. Although, it is not associated with the urethra.

The root of clitoris is fixed to the ischiopubic branches and to the perineal membrane and is made of the crus of clitoris and the bulbs of the vestibule. The crus of clitoris are two miniature corpora cavernosa without any corpus spongiosum, four centimetres long, they are fixed to the medial face of the ischiopubic branches and converge medially beneath the pubis to form the body of clitoris. They are covered by the ischiocavernosus muscle. The bulbs of the vestibule are two masses of erectile tissue attached to the perineal membrane at the side of the vagina medial to each crus of clitoris joined in front of the urethral orifice passing forwards to the glans of the

clitoris, each bulb is covered by a bulbospongiosus muscle whose fibres extend from the perineal body round the vagina and urethra to the body of clitoris. They are three and half centimetres long.

The body of the clitoris lies at the front ends of the labia minora and continues the direction of the crus, it rises up in front of the pubis and bends downwards forming the elbow of clitoris. It is covered by the prepuce through the frenulum and is highly fixed by the suspensory ligament of the clitoris fixing it to the pubis and the fundiform ligament fixing it to mons pubis and linea alba.

The glans of clitoris is the free extremity of the body and is highly sensitive to sexual stimulation.

Structurally, the clitoris is an erectile tissue made of vascular cavities separated by muscular strands, the cavernosus muscles, very abundant in the crus and the glans.

The greater vestibular glands of Bartholin are pea-shaped masses of less than one centimetre of diameter and less than five grams of weight lying at the side of the vaginal opening behind the posterior end of each bulb and deep to bulbospongiosus muscle in the vestibular sulcus, the groove between the labium minus and the hymen or its remains, and in front of the superficial transverse muscle. They are mucous glands with excretory duct heading medially to the vaginal orifice. It is two centimetres long and two millimetres wide. The greater vestibular gland is tubuloalveolar and its secretion acts as a lubricant during coitus.

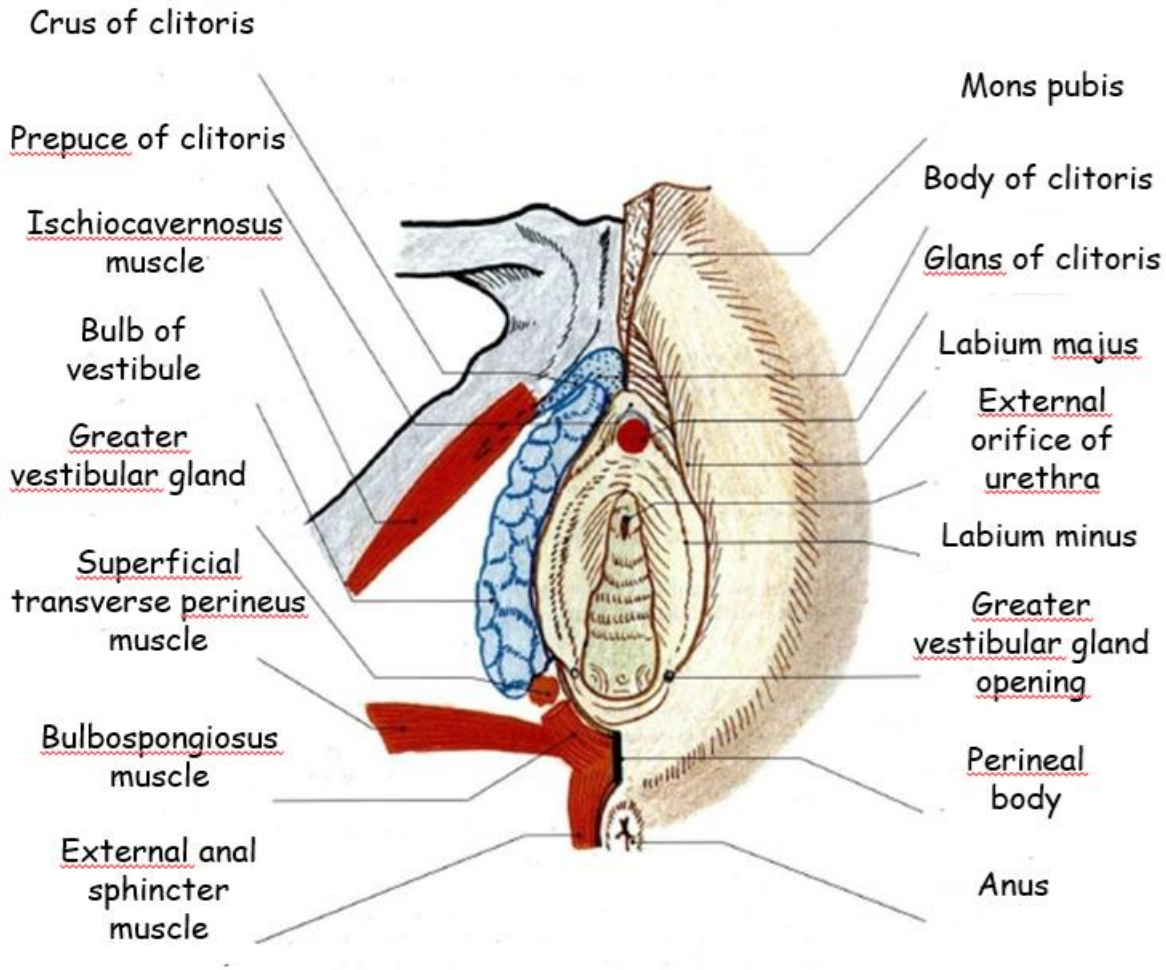

Figure 2: Anterior view of female external genital organs

III. BLOOD SUPPLY; LYMPH DRAINAGE AND NERVE SUPPLY

A- ARTERIES

The horizontal line passing by the clitoris divide the vulva into two arterial territories.

The anterior territory of the vulva is supplied by the external pudendal arteries, superior and inferior, branches of the femoral artery. Accessorily, a branch of the funicular and obturator arteries supplies this territory.

The posterior territory of the vulva is supplied by the internal pudendal artery, branch of the internal iliac artery through arteries such as the deep artery of clitoris, urethral, bulbar and for the greater vestibular gland.

B- VEINS

The veins accompany the arteries and join the internal pudendal veins to internal iliac vein to drain the posterior portion of labia and the greater vestibular gland and external pudendal veins to the great saphenous vein to drain the anterior portion of labia and mons pubis.

C- LYMPH DRAINAGE

Globally, lymphatics of the vulva drain to the inguinal lymph nodes.

Specifically, the urethral portion of the vestibule drains to the medial inguinal lymph nodes when the vaginal portion and the anal region drain to the inferior inguinal lymph nodes.

The clitoris drains to the obturator, interiliac and internal iliac lymph nodes.

The greater vestibular gland drains either to iliac or inguinal lymph nodes.

D- NERVE SUPPLY

The nerve supply of the vulva is sensitive and autonomic.

The sensitive supply is ensured by the pudendal nerve and the genital branches of the ilioinguinal, iliohypogastric and posterior femoral cutaneous nerves.

The autonomic supply is ensured by the inferior hypogastric plexus.

IV. CONSLUSION

The vagina is the copulatory organ in women and belongs to the internal female genital organs. The vulva is the external part of female reproductive system and contains the clitoris, the female sexual organ. They extend from the pelvis to the skin of the urogenital perineum and thus have several pelvic and peritoneal relations. All the formations and structures seen in the male are present in the female but greatly modified for functional reasons.