MALE INTERNAL GENITAL ORGANS

PROSTATE

I. INTRODUCTION

The prostate is a glandular organ, unique and central at the crossroads of the urinary and spermatic tracts. It is situated at the midline beneath the bladder and above the urogenital diaphragm and penetrated by the proximal part of the urethra. Thus, the prostate has a major role in fertilization and micturition. It is accessible through rectal examination.

II. DESCRIPTIVE ANATOMY

A- SITUATION

The prostate is located at the anterior part of the pelvic cavity between, forwards, the pubic symphysis, backwards, the rectum, upwards, the bladder, downwards, the superior fascia of urogenital diaphragm and laterally the sides of the funnel of levator ani muscle.

B- SHAPE

The prostate has the shape of an inverted rounded cone just like a chestnut with an upper larger base and a lower blunt apex. Its long axis is oblique forwards and downwards. The prostate has four faces, anterior, posterior and two inferolateral. Its consistency at the rectal examination is firm, and its surface is regular. The prostate is whitish grey coloured.

C- DIMENSIONS

The dimensions of the prostate are age-dependant. It is normally broader than it is long like the caecum. The prostate is four centimetres wide, three centimetres high and two centimetres thick. It weighs twenty grams.

III. SUPPORTS

The prostate is a highly fixed organ with supports at each part of it.

The base is fixed through the fusion with the internal urethral sphincter at the neck of the bladder and the perforation by the urethra which traverses the whole length of the gland.

The apex is cradled between the levator ani muscles.

The anterior surface is connected to the bodies of the pubic bones by the puboprostatic ligaments.

The inferolateral surfaces are clasped by the levator prostatae parts of levator ani.

The posterior surface is fixed by the penetration of ejaculatory ducts at the prostatic slits of the base and prostate's own ducts.

The true capsule surrounds the periphery of the gland.

The prostatic plexus strengthens the true capsule laterally.

The false capsule is a condensation of pelvic fascia, continuous, in front, with the puboprostatic ligaments and the prevesical fascia, backwards, with the rectovesical fascia of Denonvilliers which attaches to the perineal body, laterally, with the sacrorectogenitopubic fascia, downwarsds, with the superior fascia of urogenital diaphragm and, upwards, with a thin spetum separating the base

of the prostate from the base of the bladder. The false capsule contains the urethral sphincter, particularly, the arched fibres of the urethroprostatic muscle surrounding the anterior and lateral surfaces of the apex of prostate.

IV. STRUCTURE

The true capsule is a thick white layer of connective tissue at the periphery of the gland.

The fibromuscular stroma is a mixture of connective tissue and smooth muscle disposed into strands linking the true capsule to the verumontanum and separating the glandular acini.

The prostatic glands are thirty to fifty tubule-alveolar glands opened into the prostatic urethra by fifteen to thirty prostatic ducts arranged into five glandular lobes, anterior, middle, posterior and two laterals. Usually, there is no clear distinction between them. Schematically, the anterior lobe is small in front of the urethra and is, mainly, made of stroma. The middle lobe stands between the ejaculatory ducts and the proximal urethra and is much important. The posterior and lateral lobes form the right and left lobes of the prostate.

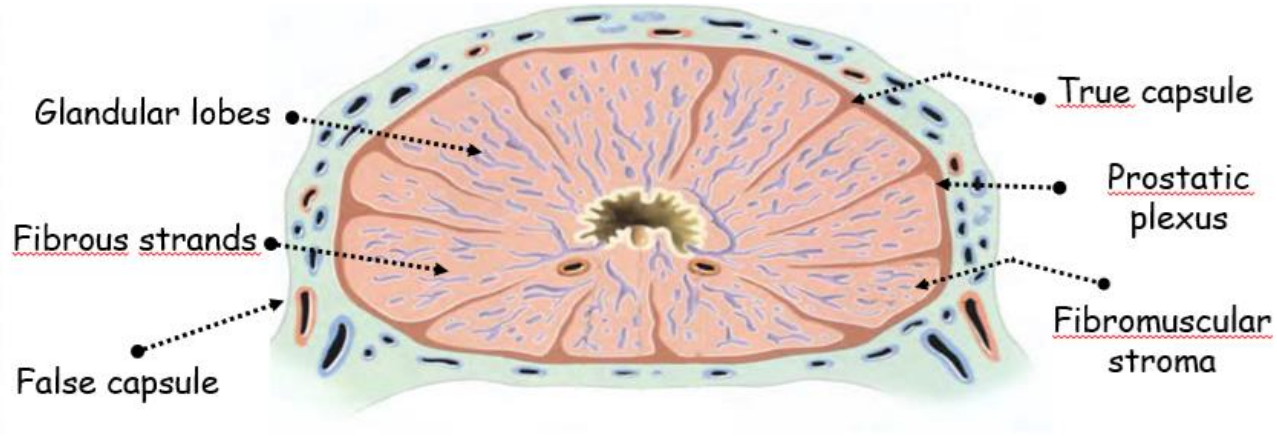


Figure 1: Horizontal section of the prostate showing its structure (From KAMINA)

The prostatic utricle is an embryonic remnant that takes the form of a half-centimetre deep pouch opened in the verumontanum between the ejaculatory ducts resulting from union of the caudal ends of the paramesonephric Mullerian ducts, homologue of the uterus.

The ejaculatory ducts travel run obliquely alongside the prostatic utricle from the prostatic slits at the base to their openings in the verumontanum of the prostatic urethra.

The prostatic ducts open on the urethral crest and in the sulcus on each side of the prostatic urethra.

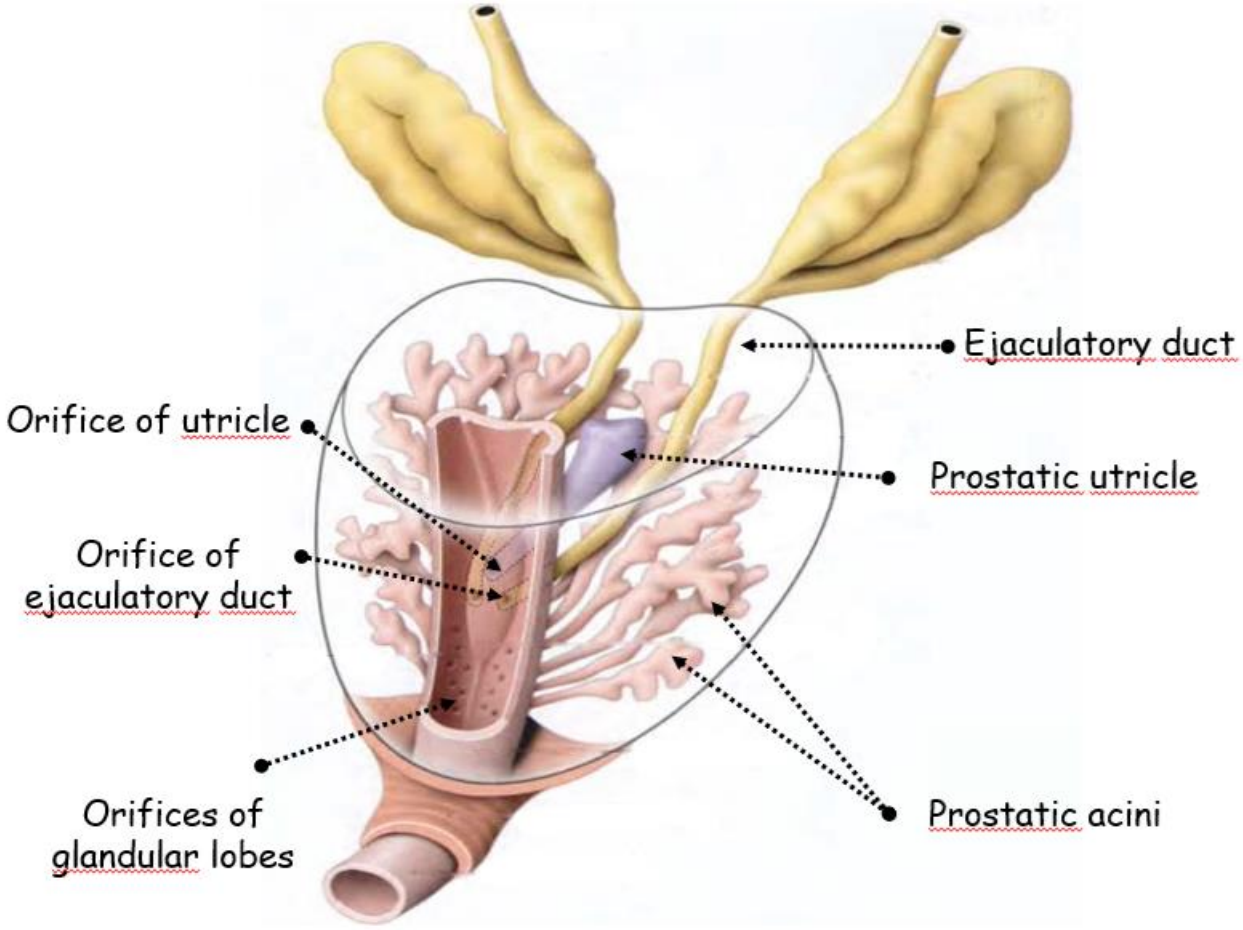


Figure 2: Figure showing the internal structure of the prostate (From KAMINA)

V. ZONAL ANATOMY OF MAC NEAL

The zonal anatomy of Mac Neal is a rather histological verumontanum-based description. (Figure 3)

The anterior zone consists, exclusively, of fibromuscular stroma.

The peripheral zone represents seventy percent of the weight of the prostate, circles the prostatic urethra under the level of the verumontanum and extends backwards and upwards.

The central zone represents twenty-five percent of the weight of the prostate, lies behind the prostatic urethra at the level of the verumontanum, circles the ejaculatory ducts and has a seminal vesicle like histology.

The transition zone consists of two lobes circling the prostatic urethra at the level of verumontanum, it extends laterally and upwards under the neck of bladder.

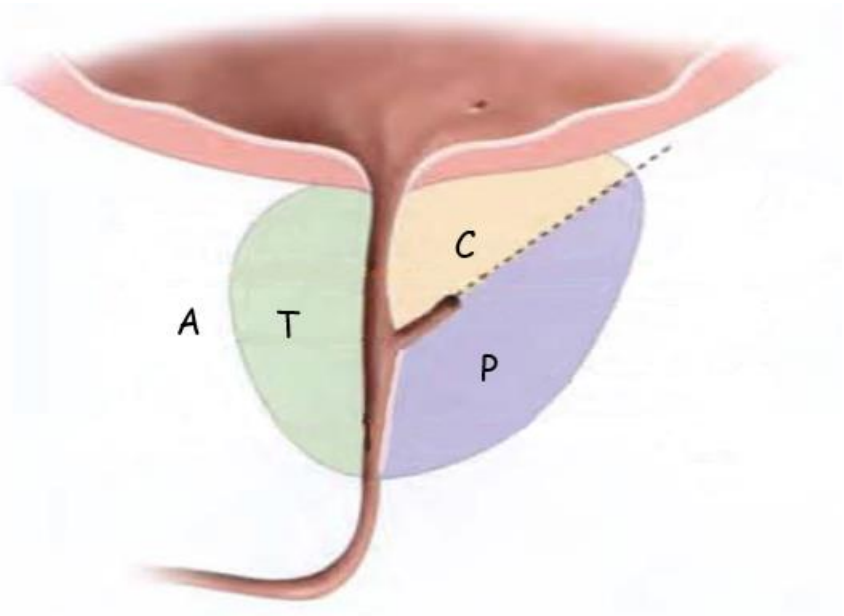


Figure 3: Figure showing the zonal anatomy of Mac Neal of the prostate (From KAMINA)

VI. BLOOD SUPPLY; LYMPH DRAINAGE AND NERVE SUPPLY

A- ARTERIES

The main arterial supply of the prostate is represented by the inferior vesical artery that is a branch of the internal iliac artery through its prostatic branch. The prostatic branch of the inferior vesical artery lies on the prostatic surface of the lateral lobes before penetrating it.

The internal pudendal and middle rectal arteries give small branches to the lower part of the prostate. Sometimes, the middle rectal artery provides the major supply.

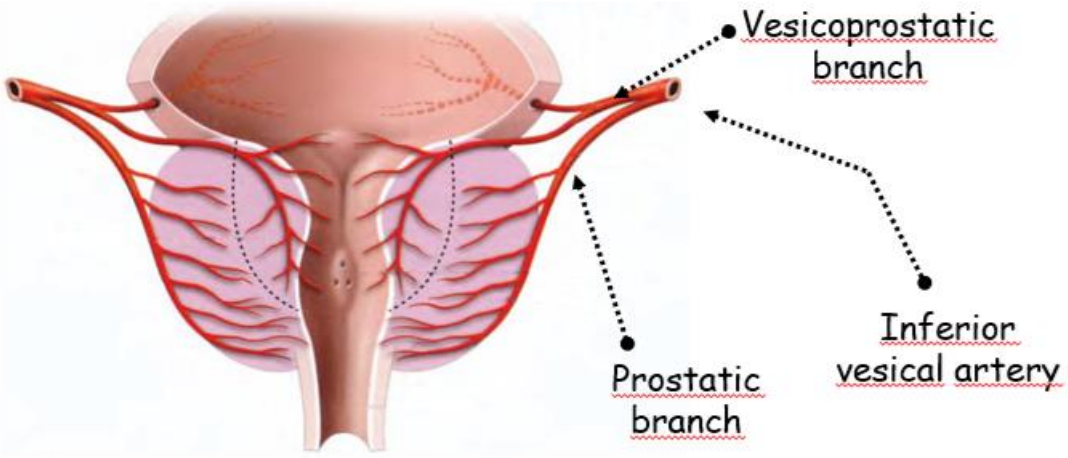


Figure 3: Figure showing the arteries of the prostate (From KAMINA)

B- VEINS

The prostate is drained by the prostatic plexus between the true and false capsules. It flows into the vesicoprostatic plexus situated at the front and sides of the groove between bladder and prostate and drains backwards into the internal iliac veins through internal pudendal veins.

C- LYMPH DRAINAGE

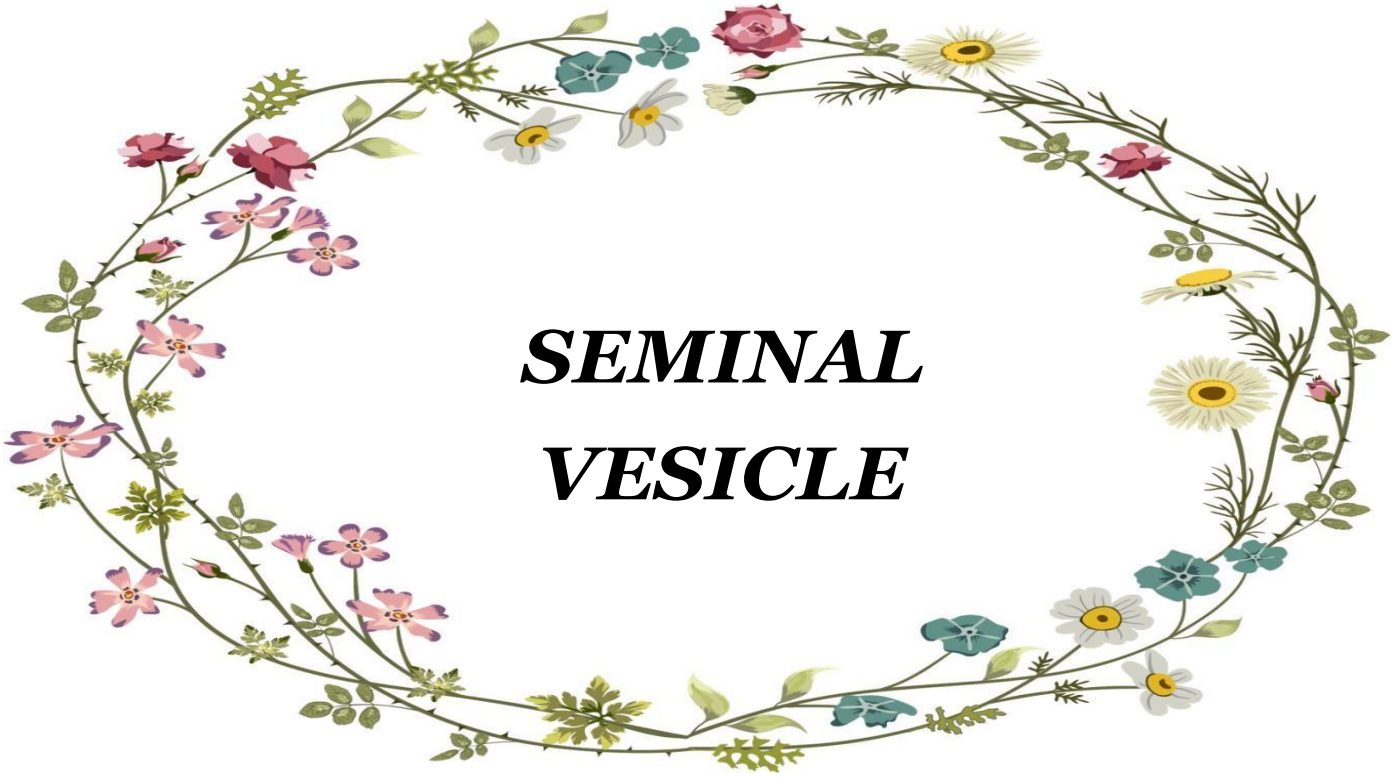
The lymphatics of the prostate around it drain into the internal iliac and sacral nodes, mainly, and the external iliac nodes, accessorily.

D- NERVES

The acini receive parasympathetic cholinergic innervation from the pelvic splanchnic nerves, but this is much less important than the muscle fibres of the stroma which contract to empty the glands during ejaculation, and which are under sympathetic adrenergic control from the inferior hypogastric plexus.

VII. SURGICAL APPROACH

Most operations for the removal of prostatic adenomata are now carried out by the transurethral route, with the resectoscope being passed along the urethra to a point proximal to the seminal colliculus, the verumontanum, so that the external urethral sphincter, which is distal to it, is not damaged during the resection. An approach through an abdominal suprapubic incision into the retropubic space gives a wide exposure of the organ.


SEMINAL
VESICLE

I. INTRODUCTION

The seminal vesicle or seminal gland is a paired exocrine gland connected to the spermatic tract. It is a thin-walled elongated sac applied against the base of the bladder above the prostate. It produces about sixty percent of the seminal fluid and acts as a spermatozoa container between ejaculations.

II. DESCRIPTIVE ANATOMY

A- SITUATION

The seminal vesicle is applied against the retrotrigonal fossa of the bladder above the prostate, each lies lateral to the ampulla of the ductus deferens of its own side, behind the retrovesical portion of the pelvic ureter and in front of the rectum.

B- SHAPE

The seminal vesicle is a lobulated, blind-ending tube much folded on itself with a long horizontal axis when the bladder is empty and vertical when the bladder is full.

Three parts can be distinguished in the seminal gland, from the top to the bottom, the tip, the body and the neck. The seminal vesicle is drained at the neck by a single duct that joins the lower end of the ampulla of the ductus deferens behind the prostate to form the ejaculatory duct.

C- DIMENSIONS

The seminal vesicle is five centimetres long, one centimetre and half wide and half a centimetre thick. Its length can reach ten centimetres when unfolded.

III. STRUCTURE

The wall of the seminal gland is made of two layers. The muscle is thin and made of inner circular layer and outer longitudinal. The mucosa is very folded with glandular appearance covered by columnar pseudostratified epithelium.

IV. ANATOMICAL RELATIONS

The seminal vesicle is applied against the retrotrigonal fossa of bladder.

Backwards, the rectovesical fascia covers the gland downwards and peritoneum of rectovesical pouch upwards towards the tip. Medially, it lies next to the ampulla of ductus deferens laterally next to the vesicoprostatic plexus and pelvic fascia, on top, below the retrovesical portion of pelvic ureter and, downwards, above the prostate.

V. BLOOD SUPPLY; LYMPH DRAINAGE AND NERVE SUPPLY

A- ARTERIES

The arteries of the seminal vesicle are branches from the inferior vesical and middle rectal arteries.

B- VEINS

The veins of the seminal vesicle drain into the vesicoprostatic plexus that flows into the internal iliac vein.

C- LYMPH DRAINAGE

The lymphatics of the seminal vesicle drain into the internal and external iliac, obturator and sacral nodes.

D- NERVES

The smooth muscle of seminal vesicles receives fibres from the pelvic plexus. The sympathetic fibres run in the branch from the first lumbar ganglion and are motor; their division produces sterility, for the paralysed muscle cannot contract to expel the stored secretion and spermatozoa, there is no emission or ejaculation.

BULBO-URETHRAL GLANDS OF COWPER

I. INTRODUCTION

The bulbo-urethral glands are paired rounded exocrine glands. They lie one on each side of the membranous urethra in the deep perineal pouch above or deep to the perineal membrane, on a level between the prostate upwards and the bulb of the penis downwards and are covered by the urethral sphincter. They make a small contribution to seminal fluid.

II. DESCRIPTIVE ANATOMY

The diameter of the bulbo-urethral gland doesn't exceed one centimetre. Its single duct is two and half centimetres long. It runs parallel to the urethra and pierces the perineal membrane posterolateral to the urethra. They open into the bulb of the penile urethra. The gland of Cowper is a tubule-alveolar gland that has a role in the lubrication of the genital tract during copulation.

III. CONCLUSION

The male internal genital organs are, mainly, glands connected to the genital tract that carry out ejaculation, copulation and thus fertilization through sperm production and spermatozoa storage. They are fixed pelvic organs with variable dimensions and relations.