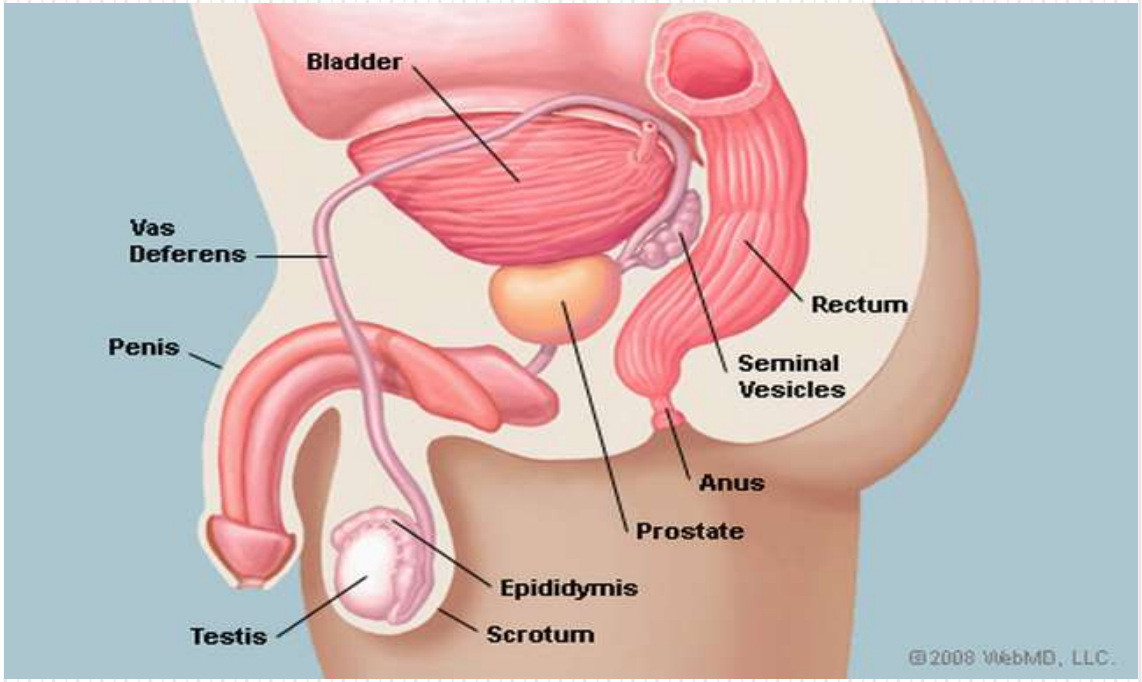
The Prostate

It is an accessory gland of male reproductive system, which surrounds the prostatic urethra

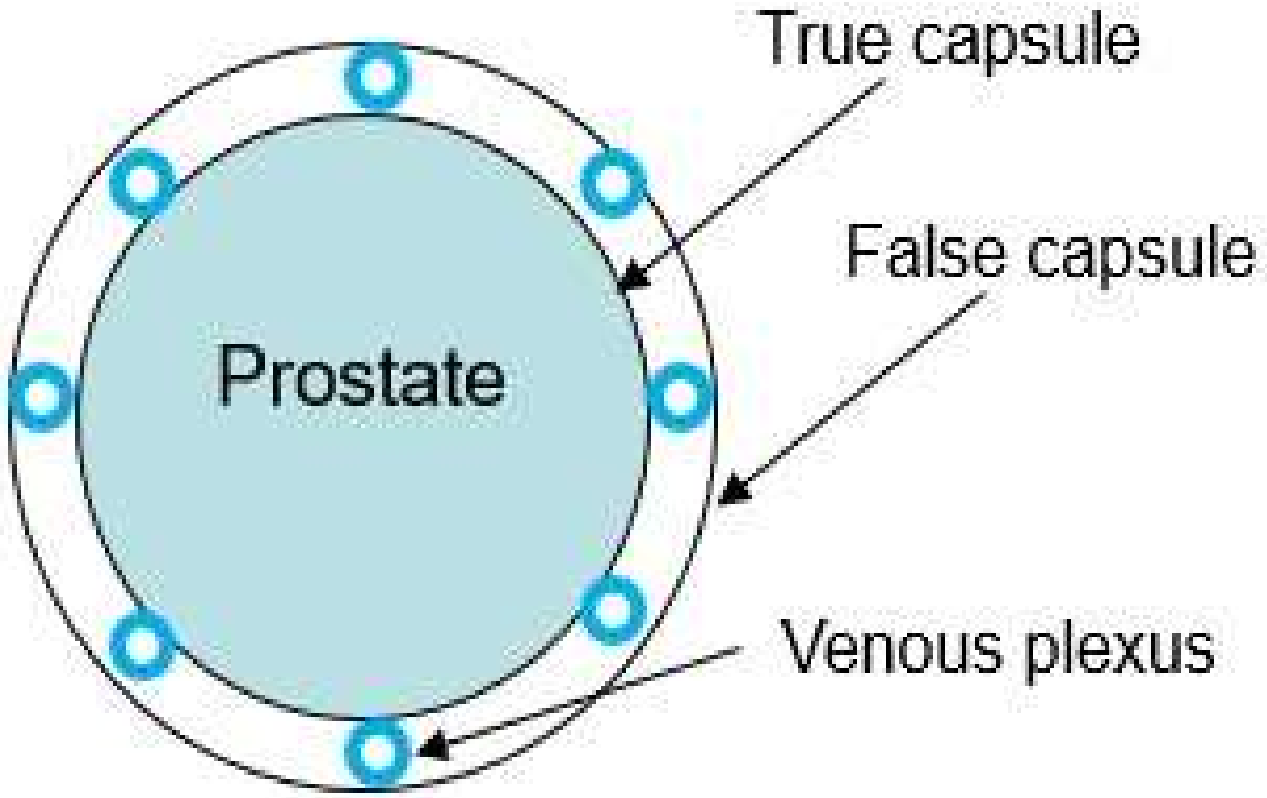


Site : it lies in the lower part of the lesser pelvis behind the inferior border of the pubic symphysis in front of the rectum, below neck of the bladder.

The prostatic capsules:

1. Inner true capsule : it is fibromuscular in structure.
2. Outer false capsule (prostatic sheath): it is a condensed visceral pelvic fascia.

Between the two capsules, lies the prostatic venous plexus.



Shape and Description:

It simulates an inverted cone which has a base (directed superiorly); an apex (directed inferiorly), four surfaces: anterior, posterior, and two inferolateral surfaces.

1- Base of the prostate :

- It is directed upwards, separated from the bladder by a groove contains part of the prostatic venous plexus.
- It is pierced by the urethra.

2- Apex of the prostate:

- Is directed downwards
- It rests on the perineal membrane (floor of the deep perineal pouch).
- The urethra emerges from the prostate anterosuperior to the apex.

3-Anterior surface:

- It is convex and lies behind the lower part of the symphysis pubis.
- Its upper part is connected to the pubic bodies by puboprostatic ligaments.
- The urethra emerges from this surface a little above and in front of the apex of the gland.

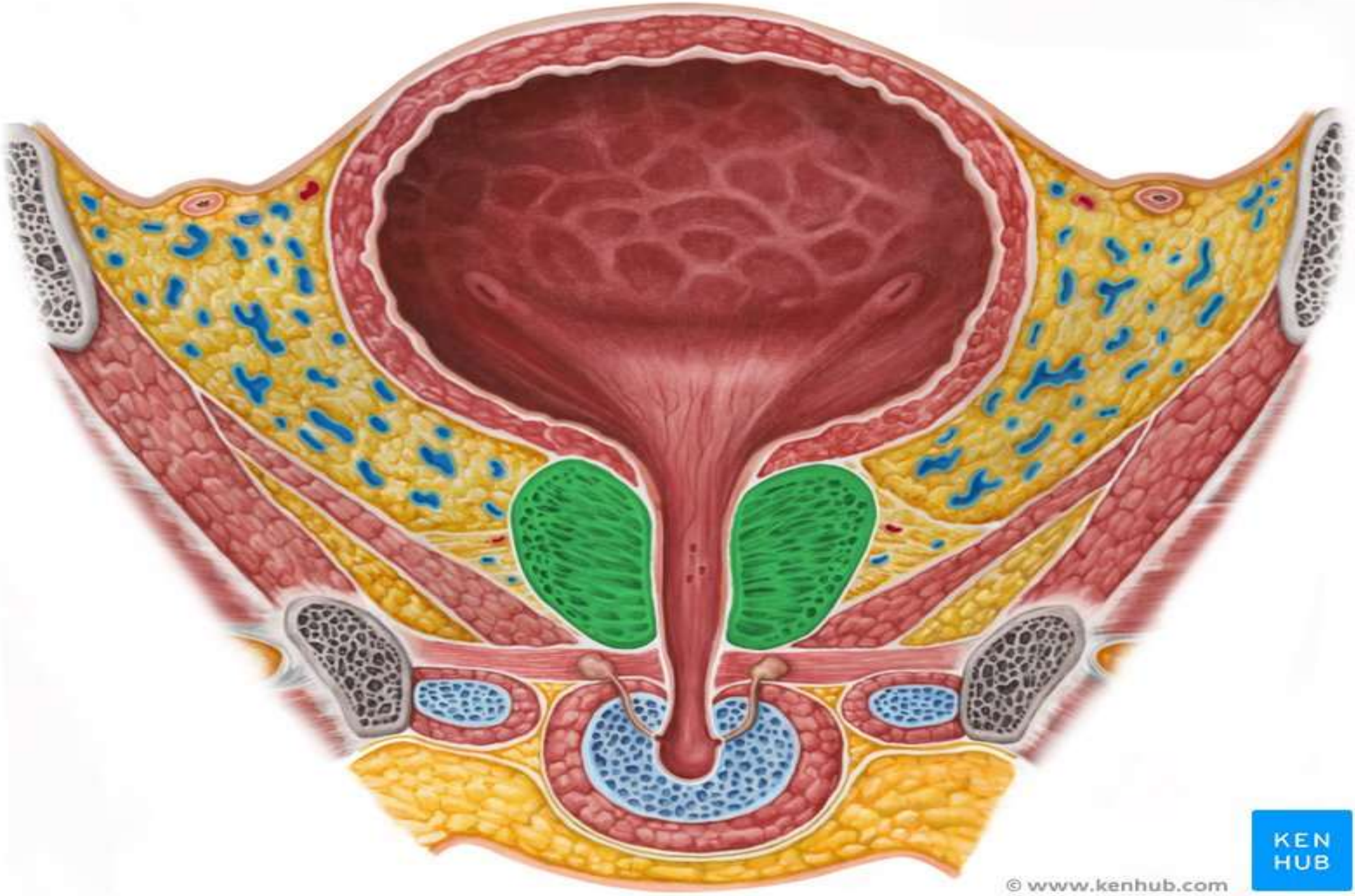
4- Posterior surface:

- It is nearly fiat and is related to ampulla of the rectum separated from it by rectovesical fascia (fascia of Denonvilliers)
- The prostate is easily palpated by a finger in the rectum
- Near its upper border, this surface is pierced by the two ejaculatory ducts.

5- Right and left inferolateral surfaces:

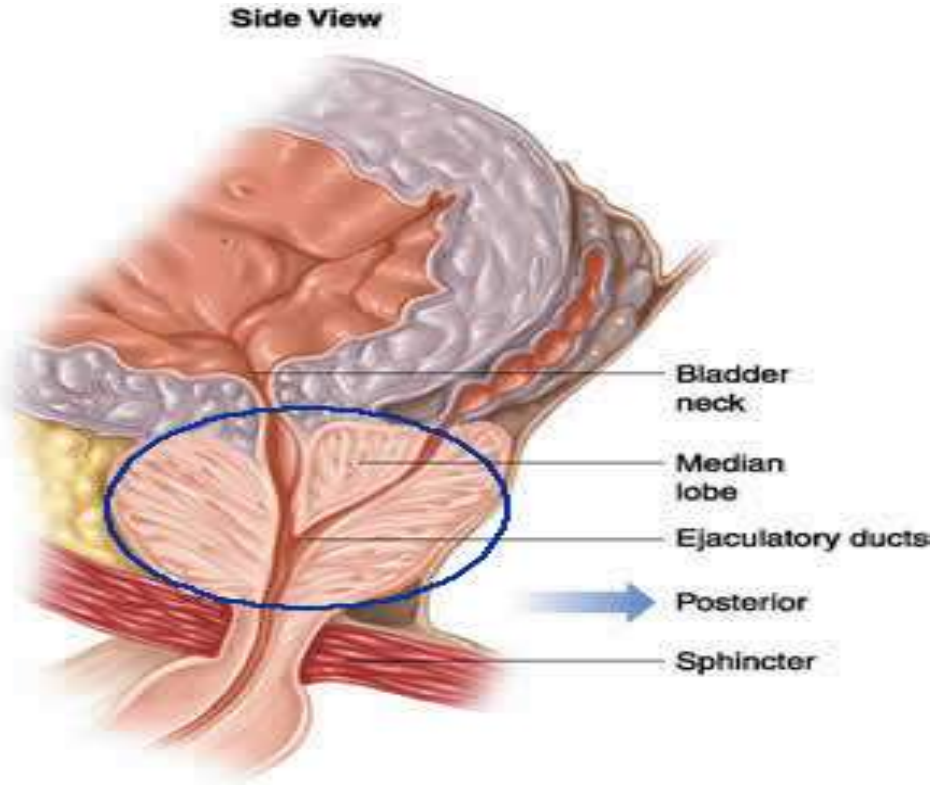
- Are convex and related to levator prostatae parts of levator ani muscle.

N.B Fascia of Denonvilliers is attached above to the floor of rectovesical pouch and below to the perineal body).



Structures that traverse the prostate :

- Prostatic urethra.
- The two ejaculatory ducts descend anteroinferiorly to open in the prostatic urethra
- The gland contains the utricle.



Lobes of the prostate:

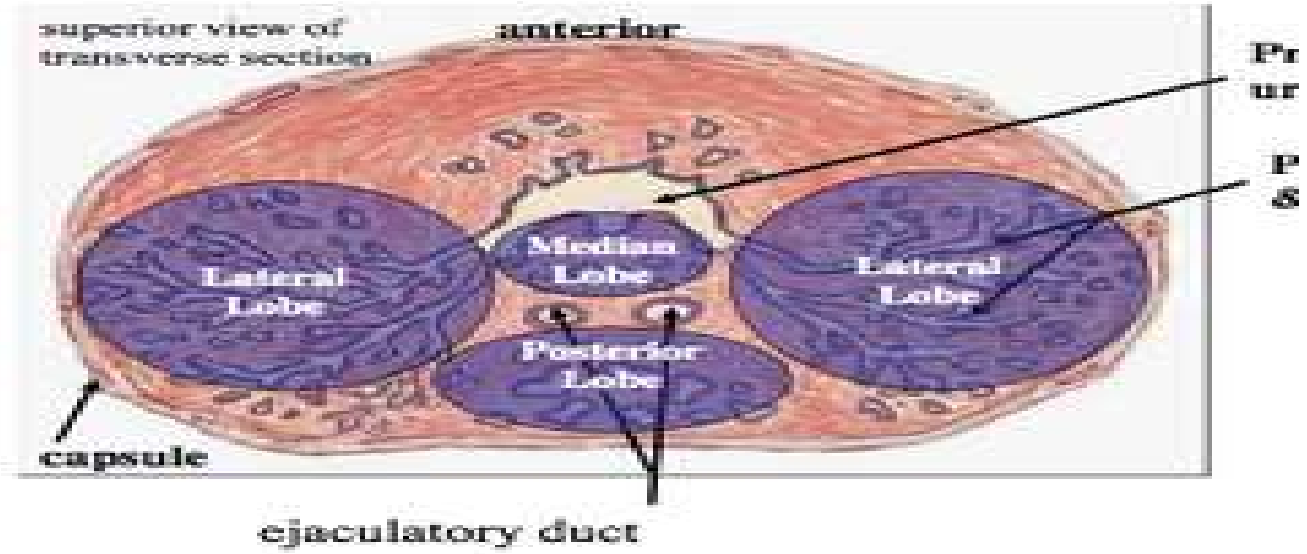
By means of the prostatic urethra and the two ejaculatory ducts, the prostate is divided into five lobes;

Anterior lobe (isthmus): lies in front of the prostatic urethra.

It consists a fibromuscular tissue with little glandular tissue.

Right and left lateral lobes : one on each of the prostatic urethra.

They are the usual sites for the senile enlargement of the prostate.



Posterior lobe : lies behind the prostatic urethra, but below the two ejaculatory ducts.

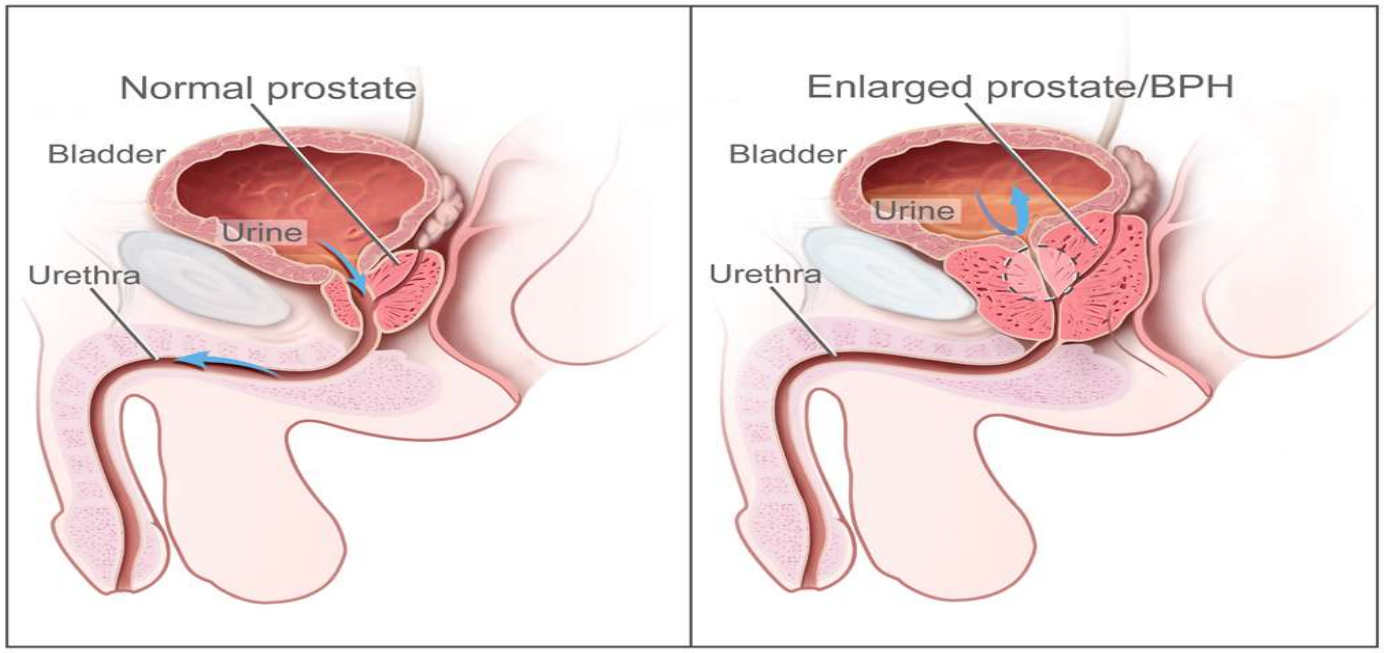
It is the usual site for cancer prostate.

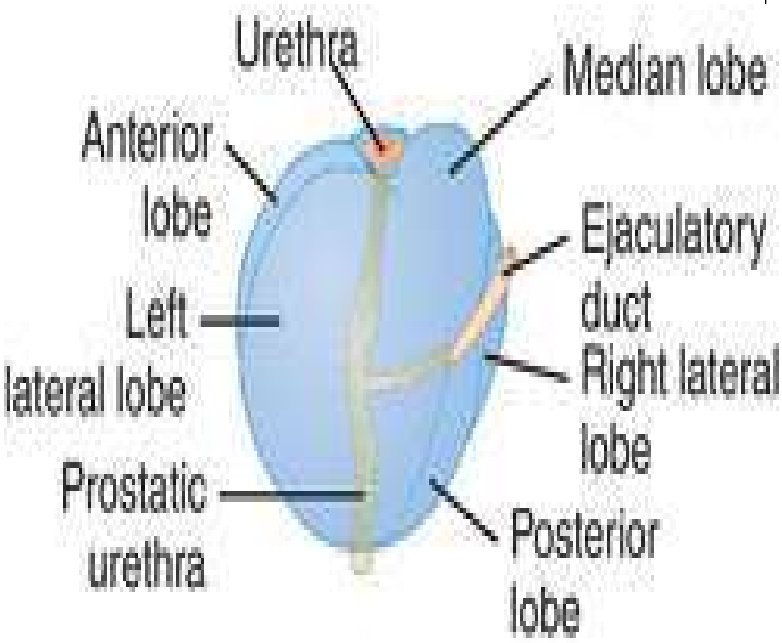
Median lobe: Lies between the upper part of prostatic urethra and the two ejaculatory ducts.

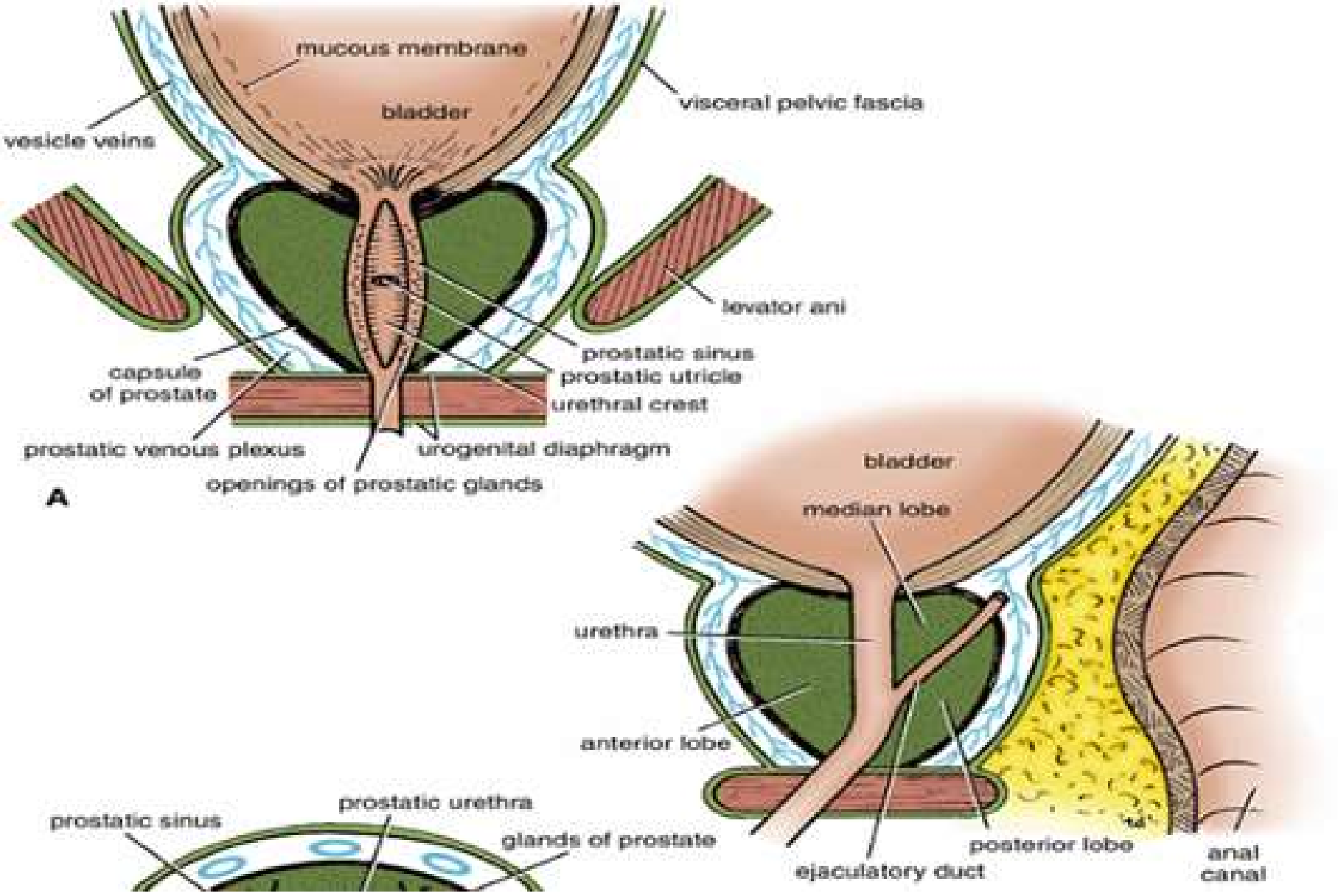
After middle age, it produces uvula vesicae, in the lower part of the bladder trigone

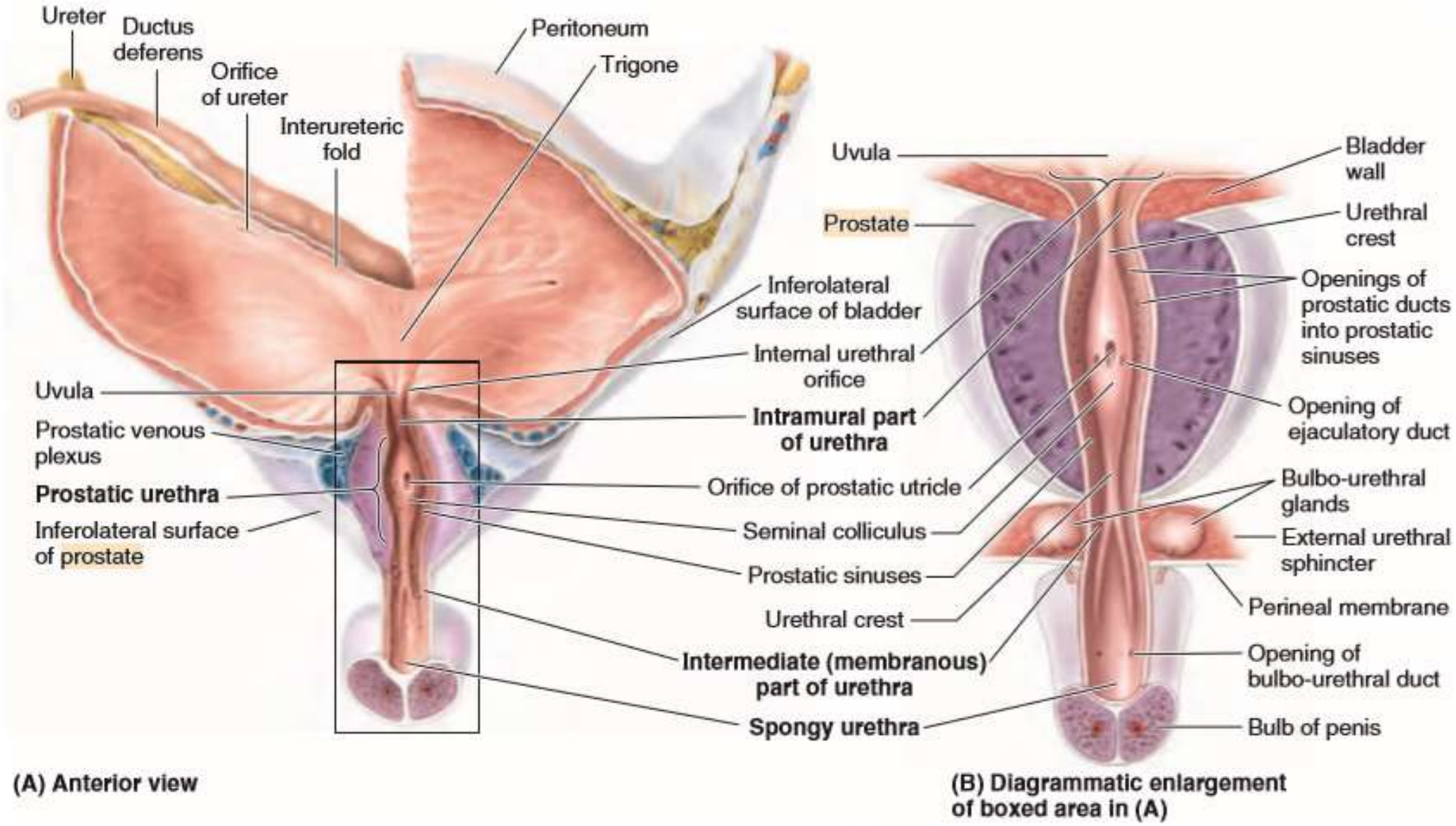
It is also a common site for senile enlargement of the prostate. (BPH)

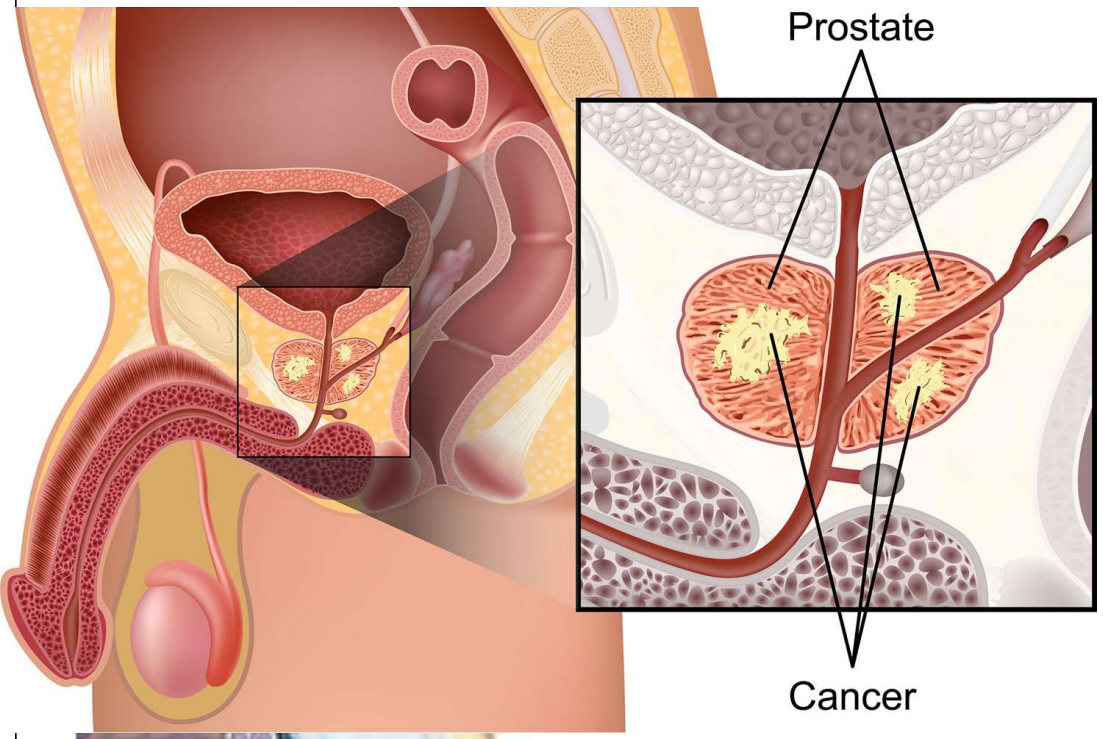
The uvula vesicae may obstruct the flow of urine at the internal urethral meatus.

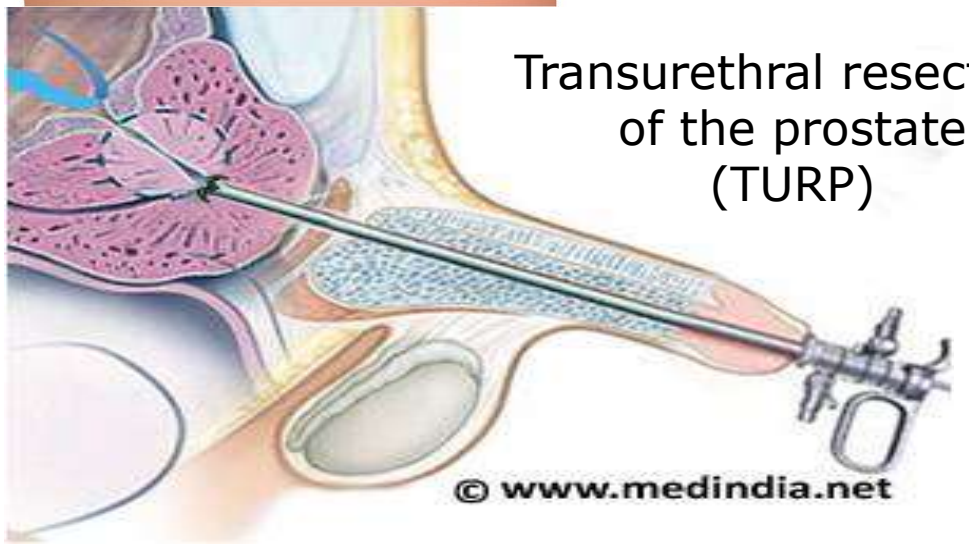




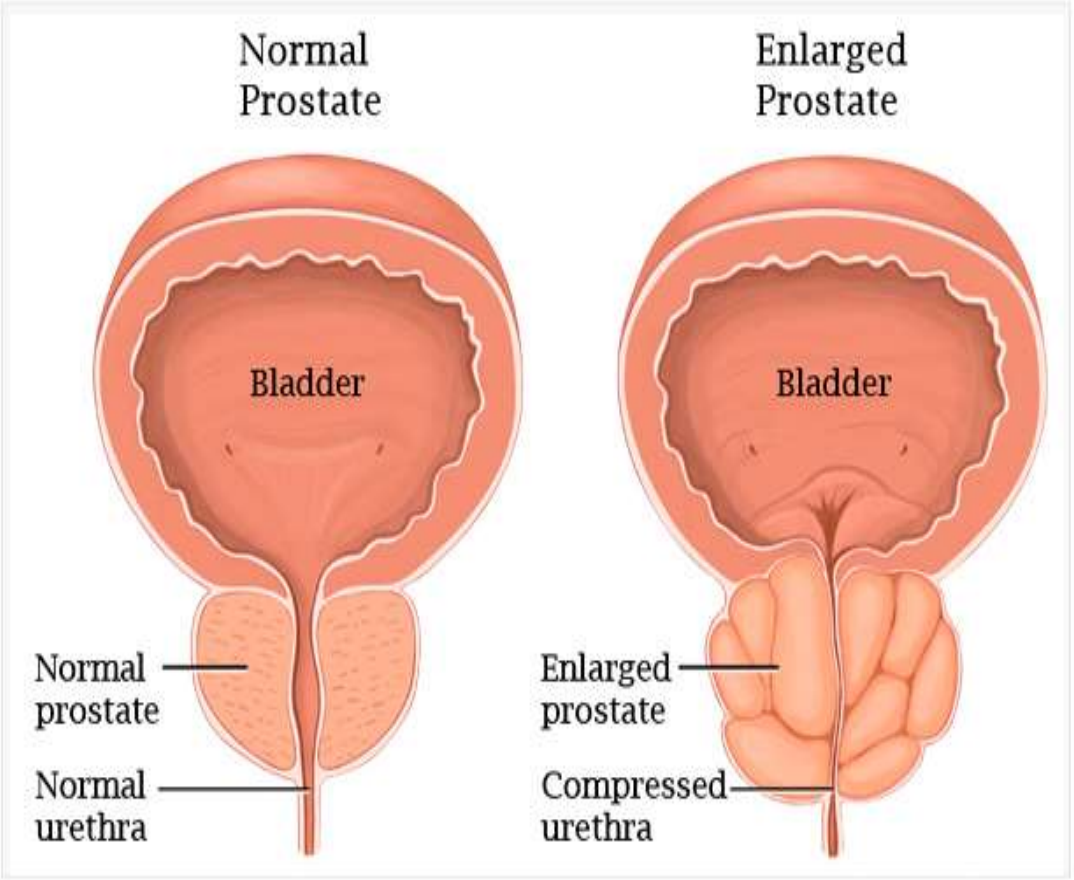

mucous membrane
bladder
vesicle veins
visceral pelvic fascia
levator ani
prostatic sinus
prostatic utricle
urethral crest
capsule
of prostate
prostatic venous plexus
urogenital diaphragm
openings of prostatic glands
A
bladder
median lobe
urethra
anterior lobe
posterior lobe
ejaculatory duct
anal
canal
prostatic urethra
prostatic sinus
glands of prostate

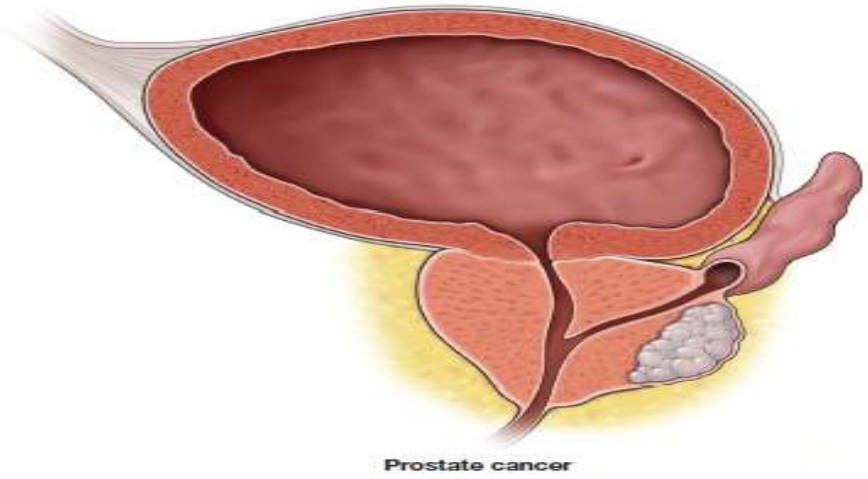

Ureter
Ductus deferens
Orifice of ureter
Interureteric fold
Peritoneum
Trigone
Uvula
Prostatic venous plexus
Prostatic urethra
Inferolateral surface of prostate
Inferolateral surface of bladder
Internal urethral orifice
Intramural part of urethra
Orifice of prostatic utricle
Seminal colliculus
Prostatic sinuses
Urethral crest
Intermediate (membranous) part of urethra
Spongy urethra
(A) Anterior view
Uvula
Prostate
Bladder wall
Urethral crest
Openings of prostatic ducts into prostatic sinuses
Opening of ejaculatory duct
Bulbo-urethral glands
External urethral sphincter
Perineal membrane
Opening of bulbo-urethral duct
Bulb of penis
(B) Diagrammatic enlargement of boxed area in (A)



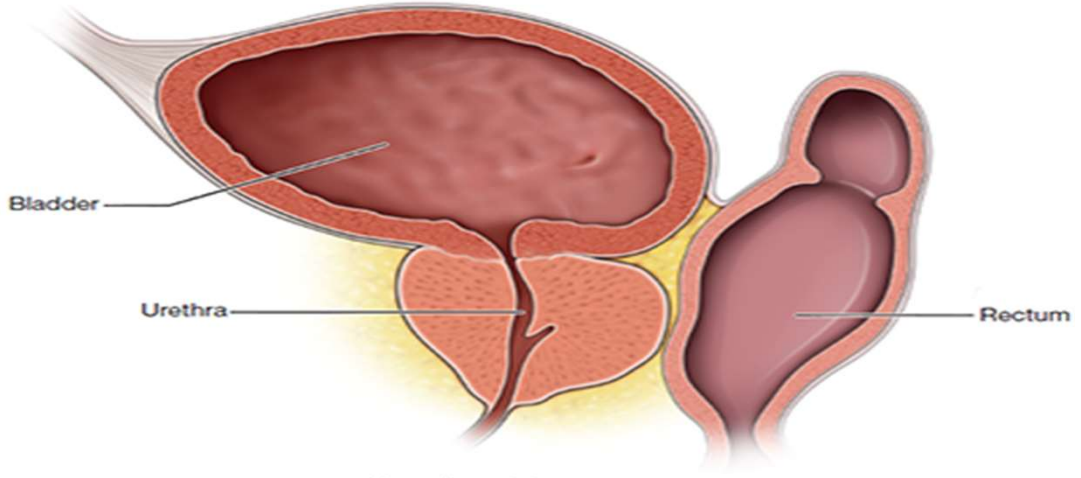


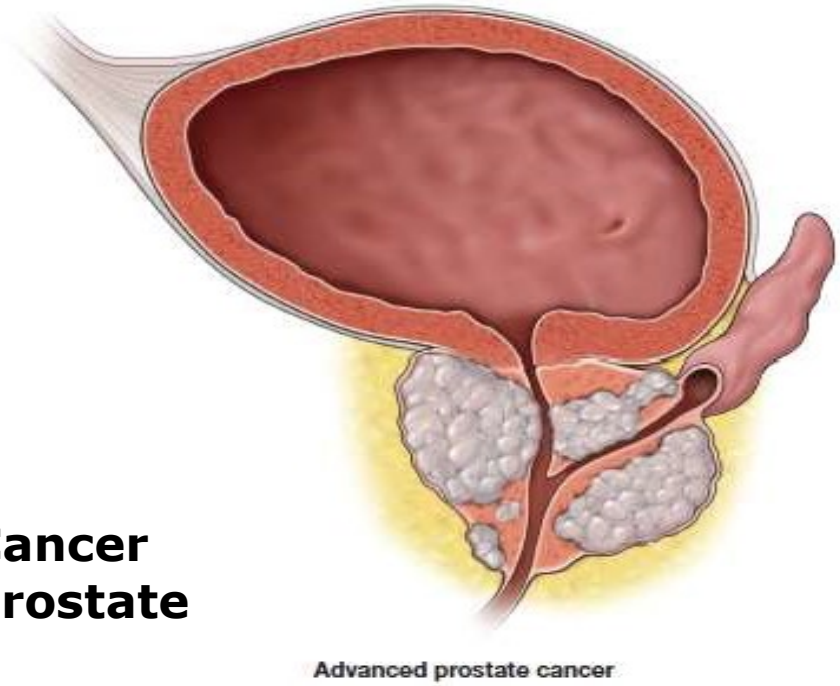
Transurethral resection of the prostate (TURP)





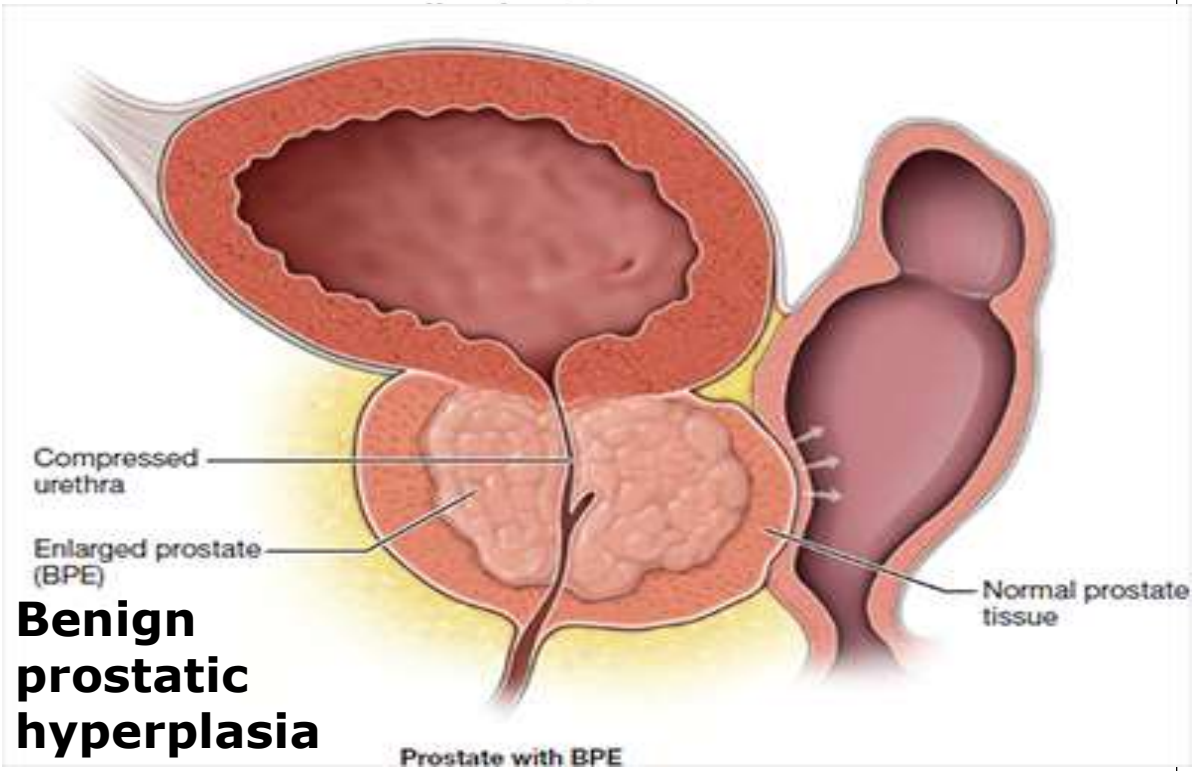
Prostate cancer





Advanced prostate cancer

Cancer prostate



Prostate with BPE

Benign prostatic hyperplasia

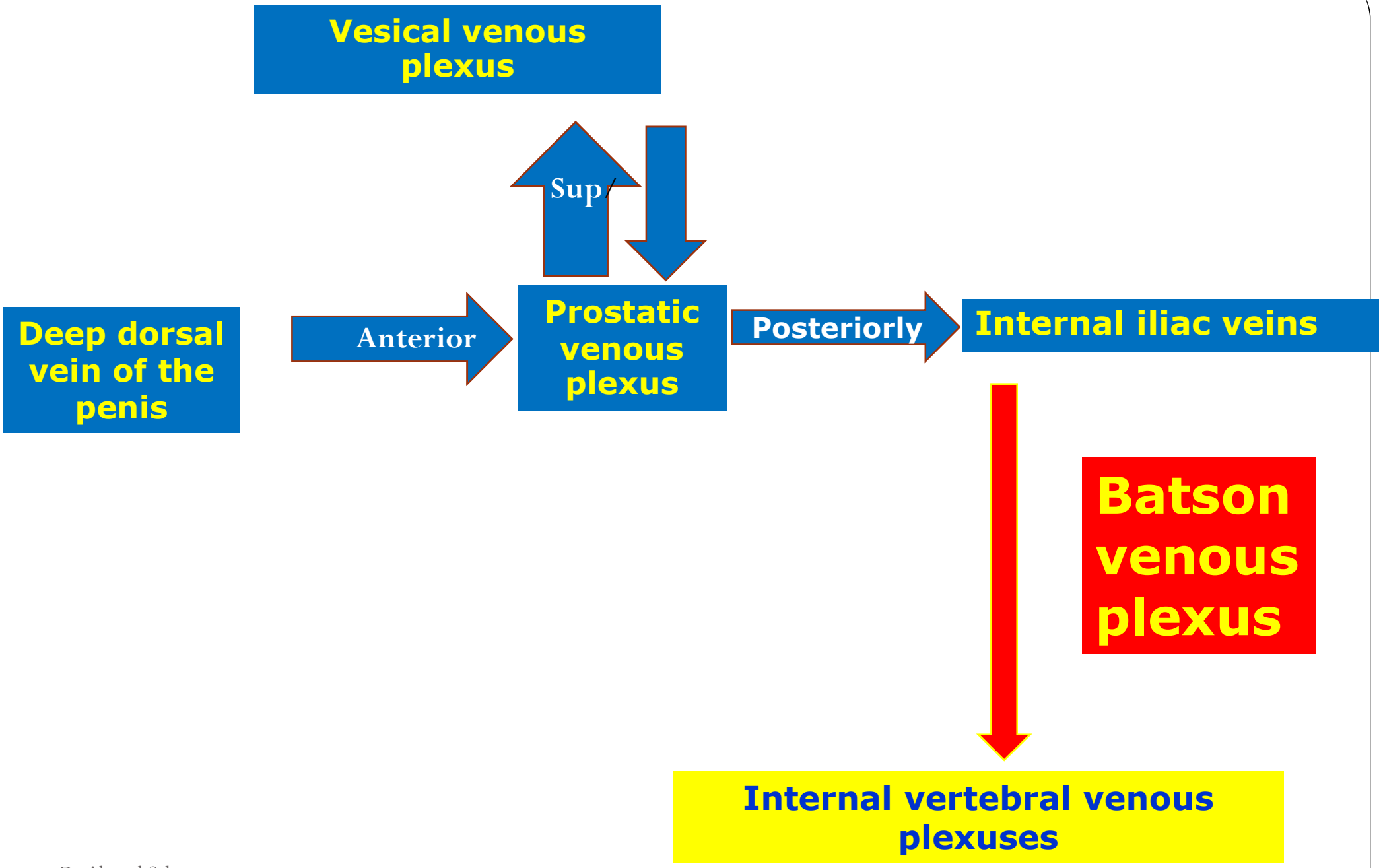
Blood Supply of the Prostate:

Arteries are derived from inferior vesical and middle rectal arteries.

Venous drainage : the veins form the prostatic venous plexus which has the following features :

- It is embedded between the two capsules of the prostate.
- It is present only in front and sides of the gland
- Superiorly, it is continuous with the vesical venous plexus.
- Anteriorly : it receives the deep dorsal vein of penis.
- Posterolaterally : the plexus is drained to the internal iliac veins which in turn communicates with the internal vertebral venous plexuses by the Batson venous plexus.

These veins are valveless and responsible for spread of cancer prostate to lumbar vertebrae


Vesical venous plexus
Sup
Deep dorsal vein of the penis
Anterior
Prostatic venous plexus
Posteriorly
Internal iliac veins
Batson venous plexus
Internal vertebral venous plexuses

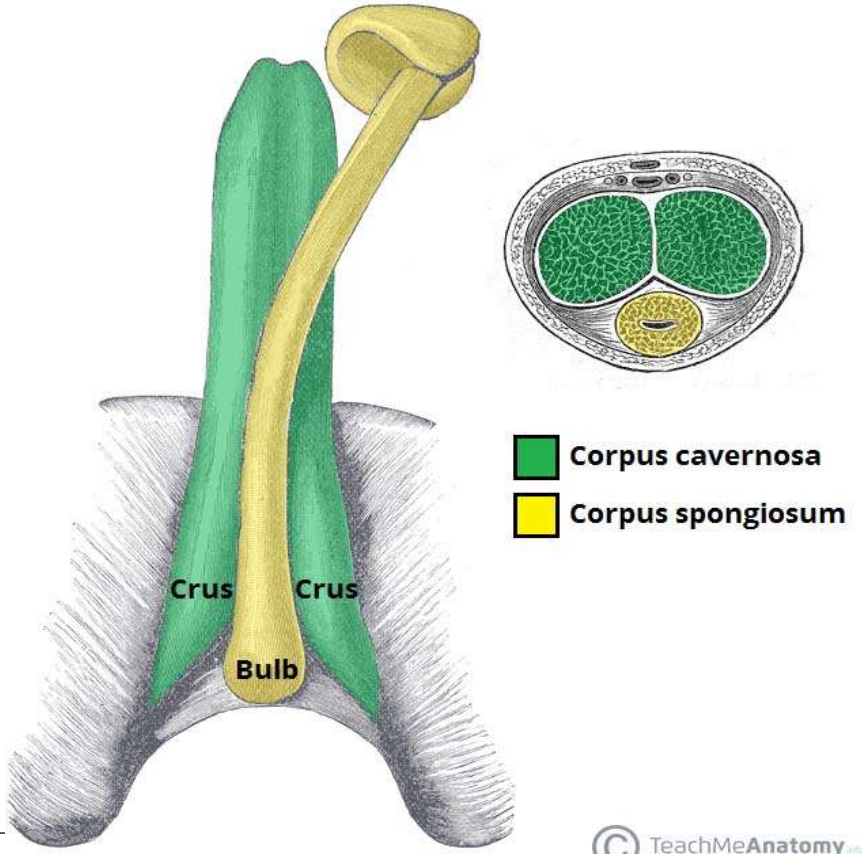
Lymphatic Drainage: to internal, external iliac lymph nodes.

Nerve Supply: by prostatic nerve plexus derived from the inferior hypogastric plexus.

Acid phosphatase and Prostate-Specific Antigen (PSA) are markedly elevated in prostatic diseases especially carcinoma

Penis

- It has a root (or attached portion) and a shaft (or free potion).
- The root is formed of 3 parts; two cururа (right and left) and bulb of penis, all are present in the superficial perineal pouch of perineum .
- The **bulb** is covered on its outer surface by the **bulbospongiosus** muscles
- The shaft is formed of 3 columns of erectile tissue; two corpora cavernosa (right and left) and a median corpus spongiosum.
- Each **crus** is attached to the side of the pubic arch and is covered on its outer surface by the **ischiocavernosus** muscle.



The shaft of the penis

The body of the penis is essentially composed of three cylinders of erectile tissue enclosed in a tubular sheath of fascia (Buck's fascia).

A- The two corpora cavernosa:-

- They lie dorsally side by side in the shaft of penis.
- The corpora cavernosa contain many irregular cavernous spaces which become filled by blood during erection.
- Each is firmly surrounded by fibrous tissue called tunica albuginea
- Followed distally, the corpora cavernosa end in pointed projections within the glans penis
- Followed proximally (towards the root of the penis), the two corpora cavernosa diverge from each and continue as the crus penis, which becomes firmly attached to the ischio pubic ramus

B- The corpus spongiosum

It is median and lies in the ventral surface of the two corpora cavernosa.

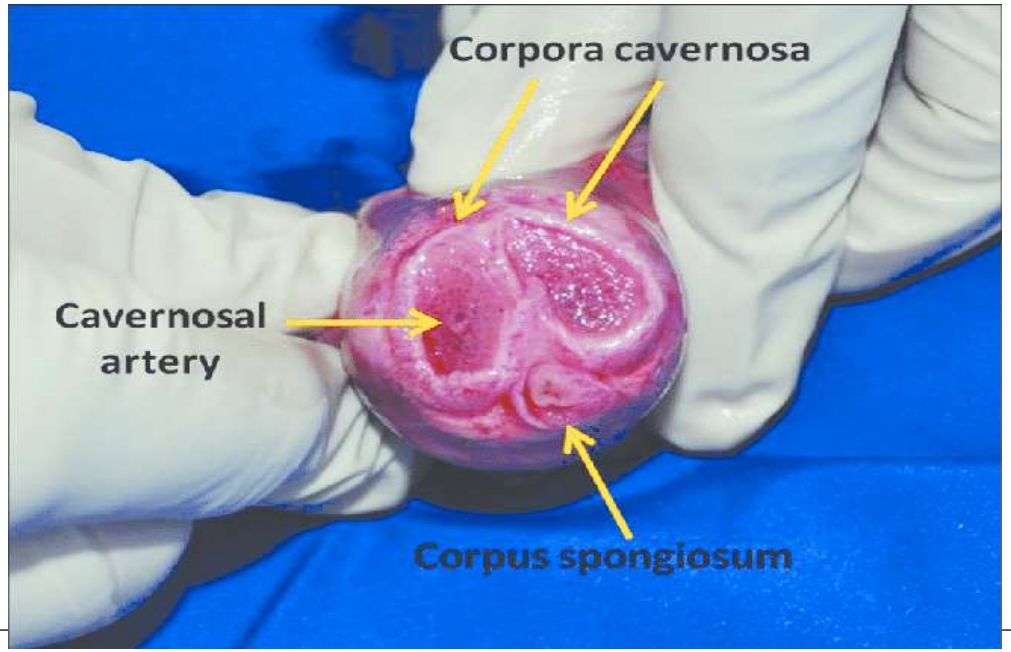
It is also surrounded by a separate sheath of tunica albuginea

Followed distally, it forms glans penis ,The base of the glans penis is called the corona glandis

Followed proximally (towards the root of the penis), it forms bulb of penis which is attached to the perineal membrane.

The corpus spongiosum is traversed by the penile part of the urethra.

It also contains cavernous tissue capable of erection.



The skin of the penis

Followed distally, the skin forms a loose fold called the prepuce or foreskin which covers the glans.

The deep layer of this fold is attached to the coronary sulcus of the glans by frenulum

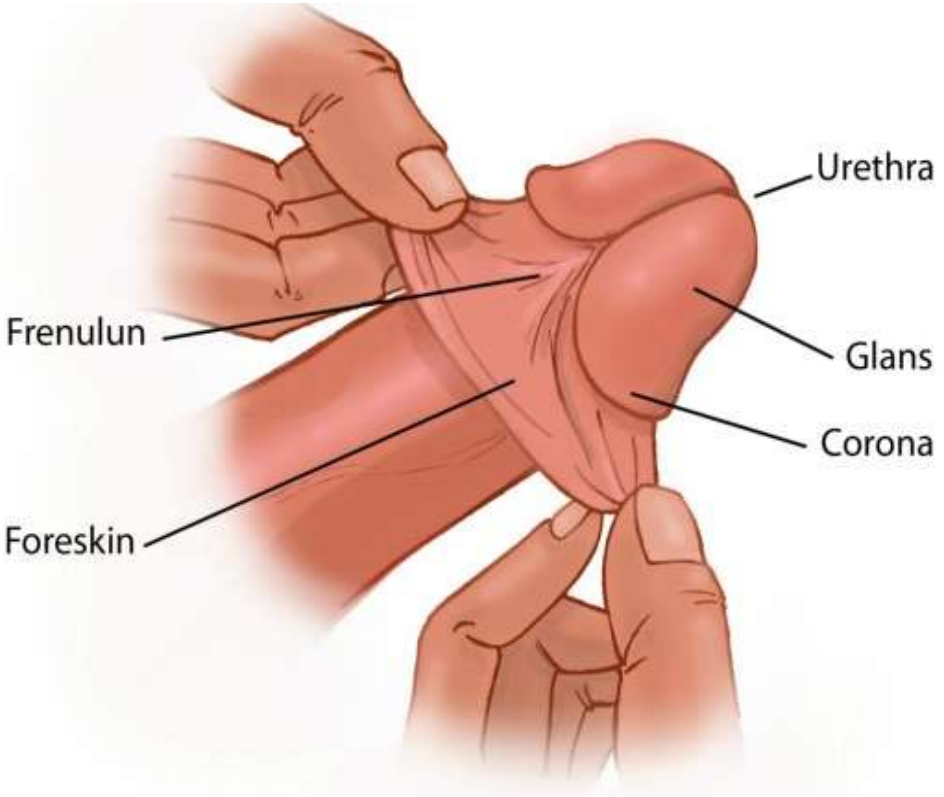
Followed proximally.

The fascia of the penis

The superficial penile fascia is devoid of fat (like the scrotum) but rich in loose connective tissue to allow free movement of skin over the shaft of penis.

Bushra wants to circumcise her son ADAM (1month old)

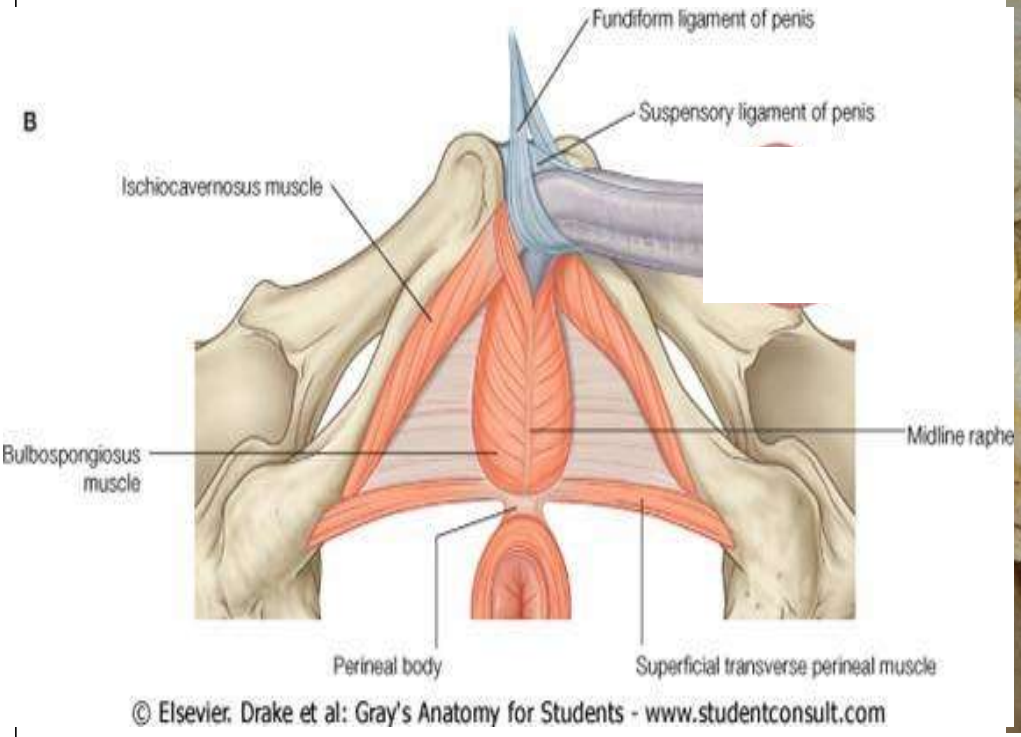
Circumcision
is the operation of removing the greater part of the prepuce, or foreskin.

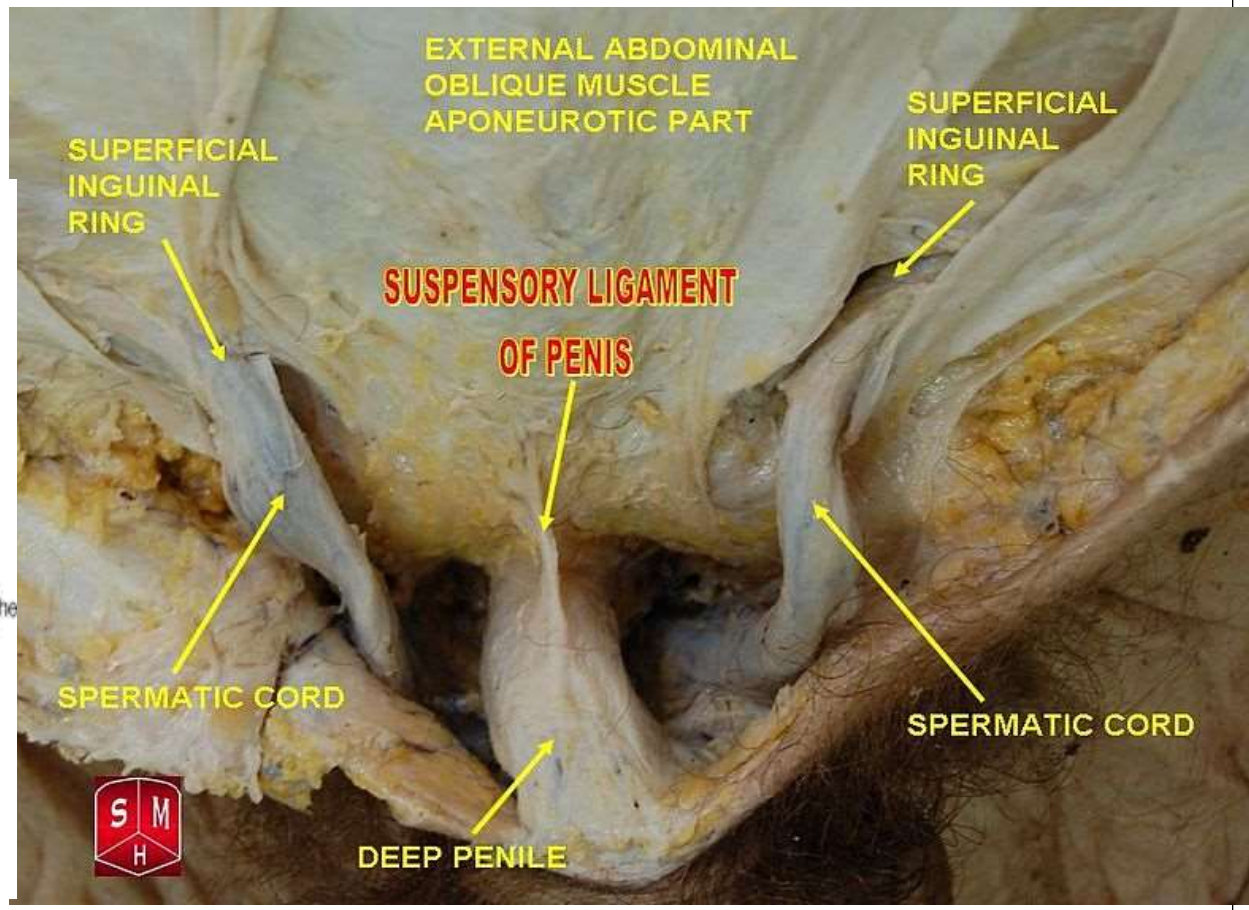


The ligaments of the penis

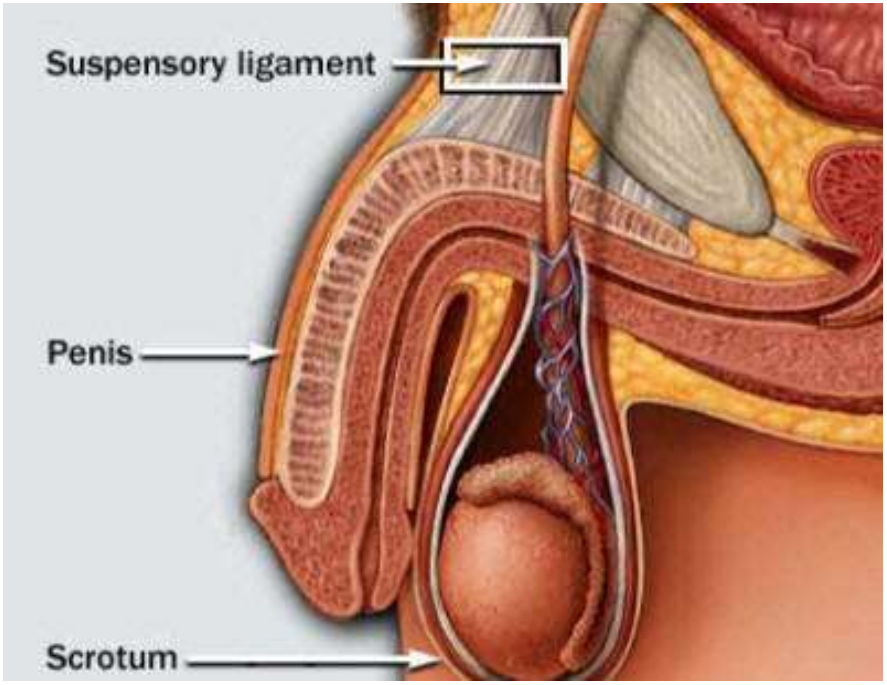
Fundiform ligament: arise from the lower part of the linea alba, its fibers split to surround the proximal part of the penile shaft to insert into the midline raphe of the scrotum.

Suspensory ligament: (deep to the fundiform ligament), extends from the symphysis pubis and blends below with fascia penis.





Fundiform ligament



Suspensory ligament

Arteries of the penis

All are branches of internal pudendal artery and all are paired (right and left).

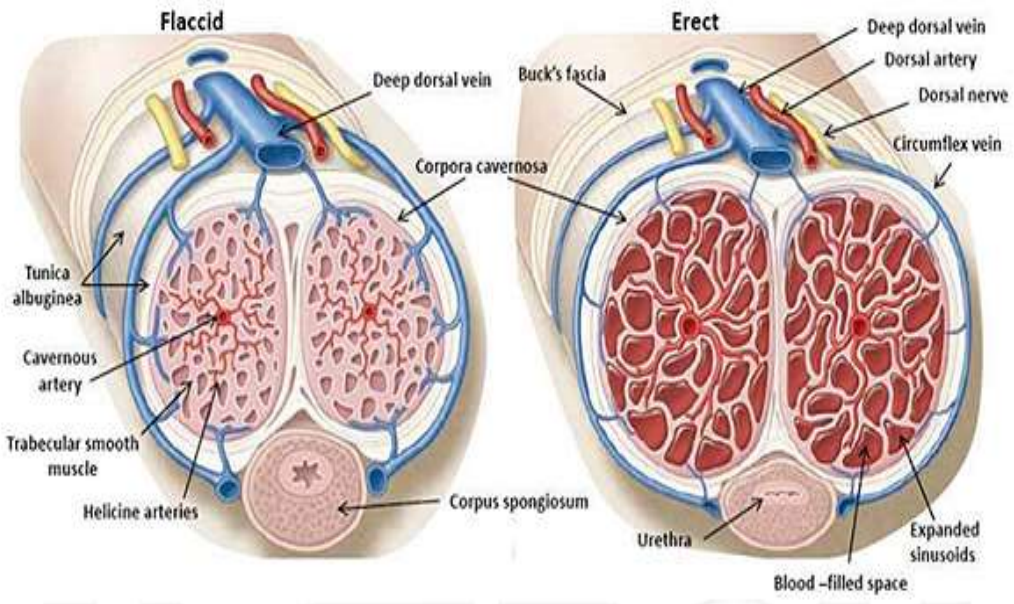
- ***Dorsal artery*** of the penis supplies the skin, fascia, and glans .
- ***Deep artery*** of the penis supplies the corpus cavernous with convoluted helicine arteries
- ***Artery of the bulb*** supplies the corpus spongiosum and glans penis

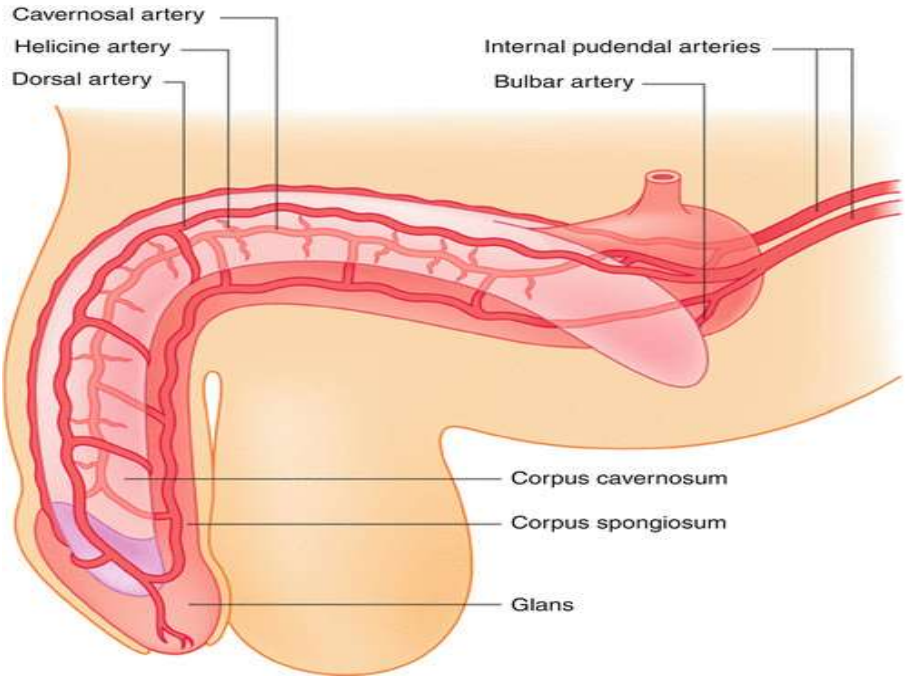
Venous drainage

By 2 dorsal veins which are superficial and deep;

1 . *Superficial dorsal vein* (superficial to the fascia penis); divides into right and left .Each ends in the corresponding superficial external pudendal vein.

2. *Deep dorsal vein of the penis* (deep to fascia penis), passes below symphysis pubis to terminate in prostatic venous plexus.





Lymph drainage

From the penis into ***superficial inguinal lymph nodes*** (with the scrotum).

From glans penis, lymphatics drain ***directly*** to gland of ***Cloquet*** in the femoral canal.

Nerves of the penis

1. ***Dorsal nerve of the penis*** (sensory), is a branch of pudendal nerve, runs ***lateral*** to the dorsal artery of the penis

2. ***Cavernous nerves*** (autonomic) arise from the inferior hypogastric plexus ,Parasympathetic fibers (S2,3,4) produce vasodilatation & erection of penis