BENIGN PROSTATIC HYPERPLASIA BPH

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objectives

- Defintion
- Etoilogy
- Clinical picture
- Differential diagnosis
- Complication
- Treatment options

BENIGN PROSTATIC HYPERPLASIA
BPH

Definition

- I- Microscopic (BPH) refers to histological proliferation.
- II- Macroscopic: senile prostatic enlargement (SPE) refers to organ enlargement due to cellular proliferation.
- III-Clinical: refers to the lower urinary tract symptoms thought to be due to BP obstruction.

BENIGN PROSTATIC HYPERPLASIA
Incidence

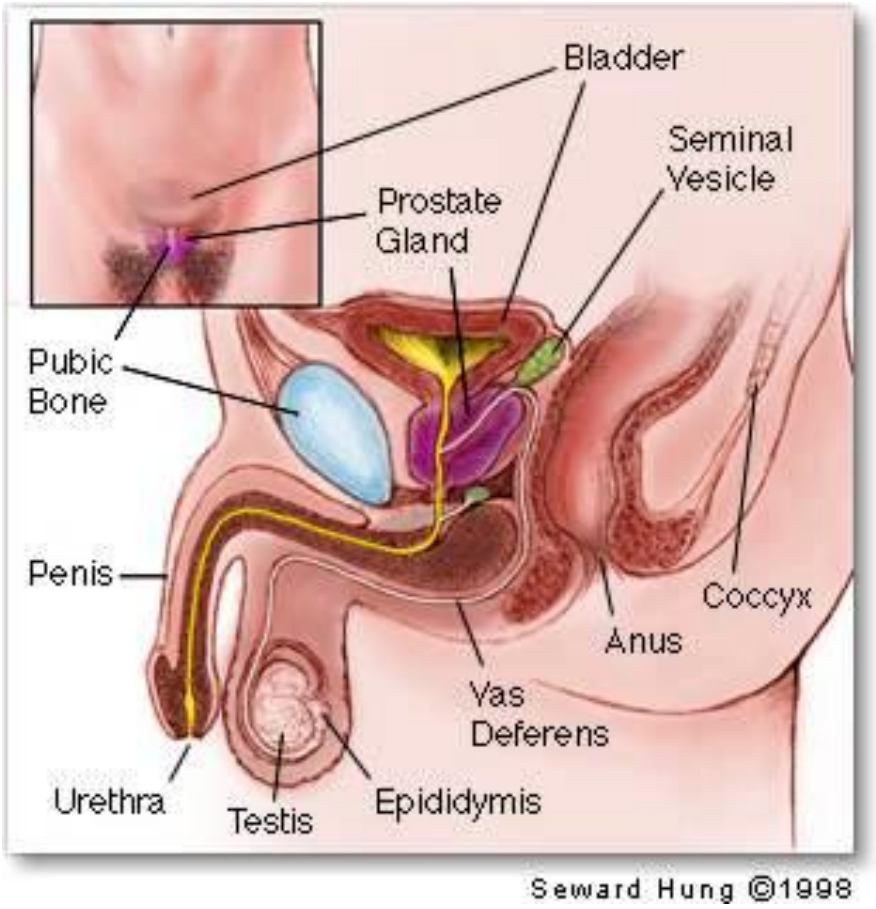
- BPH is a disease of the elderly men

- The most common benign neoplasm in the aging male

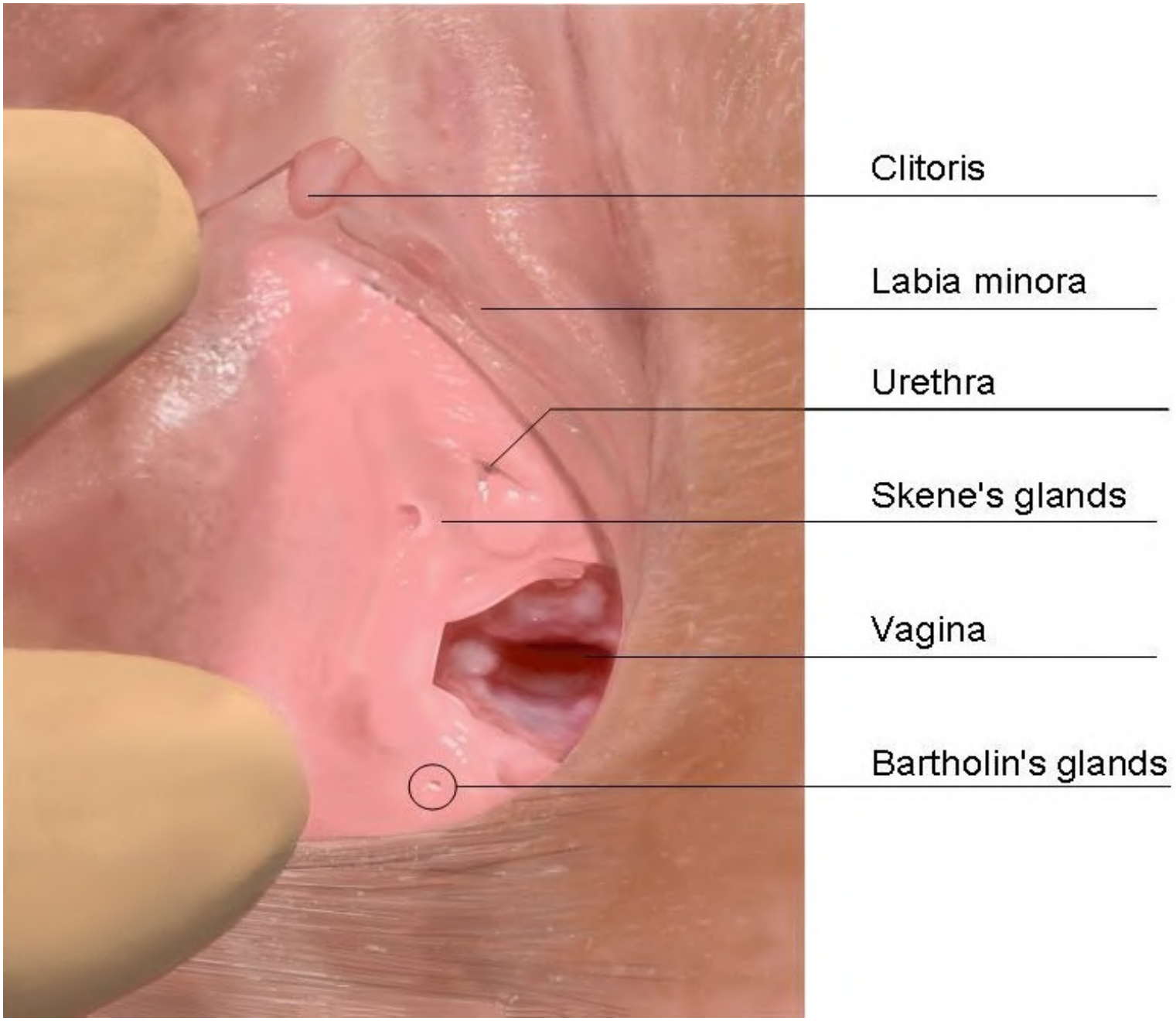
- Usually > 60 years Rarely < 40years

- Normal prostate is about 18-25 gm

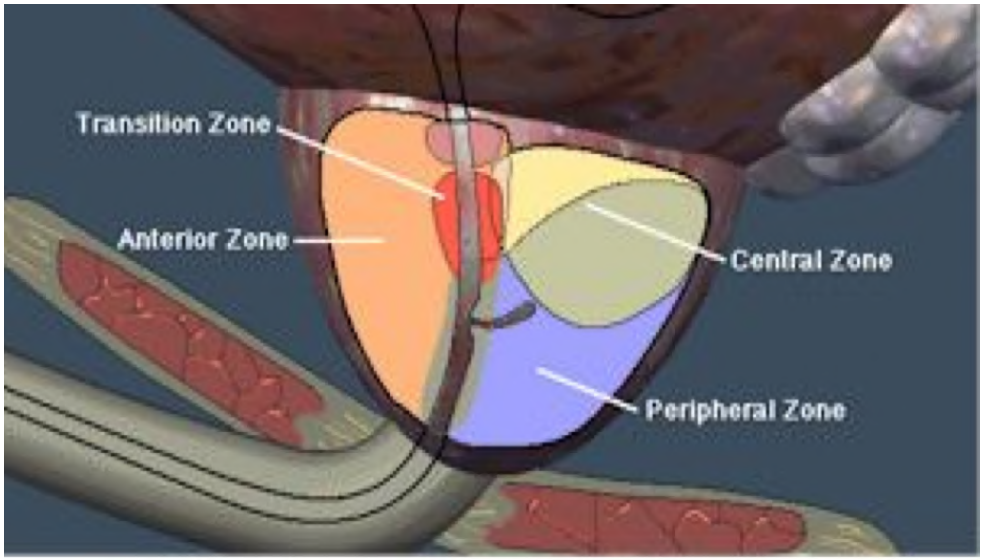
The Prostate Gland



- Male sex gland
- Pear-shape,wt7-16gm
- produces fluid component of semen
- Produces Prostate Specific Antigen (PSA)

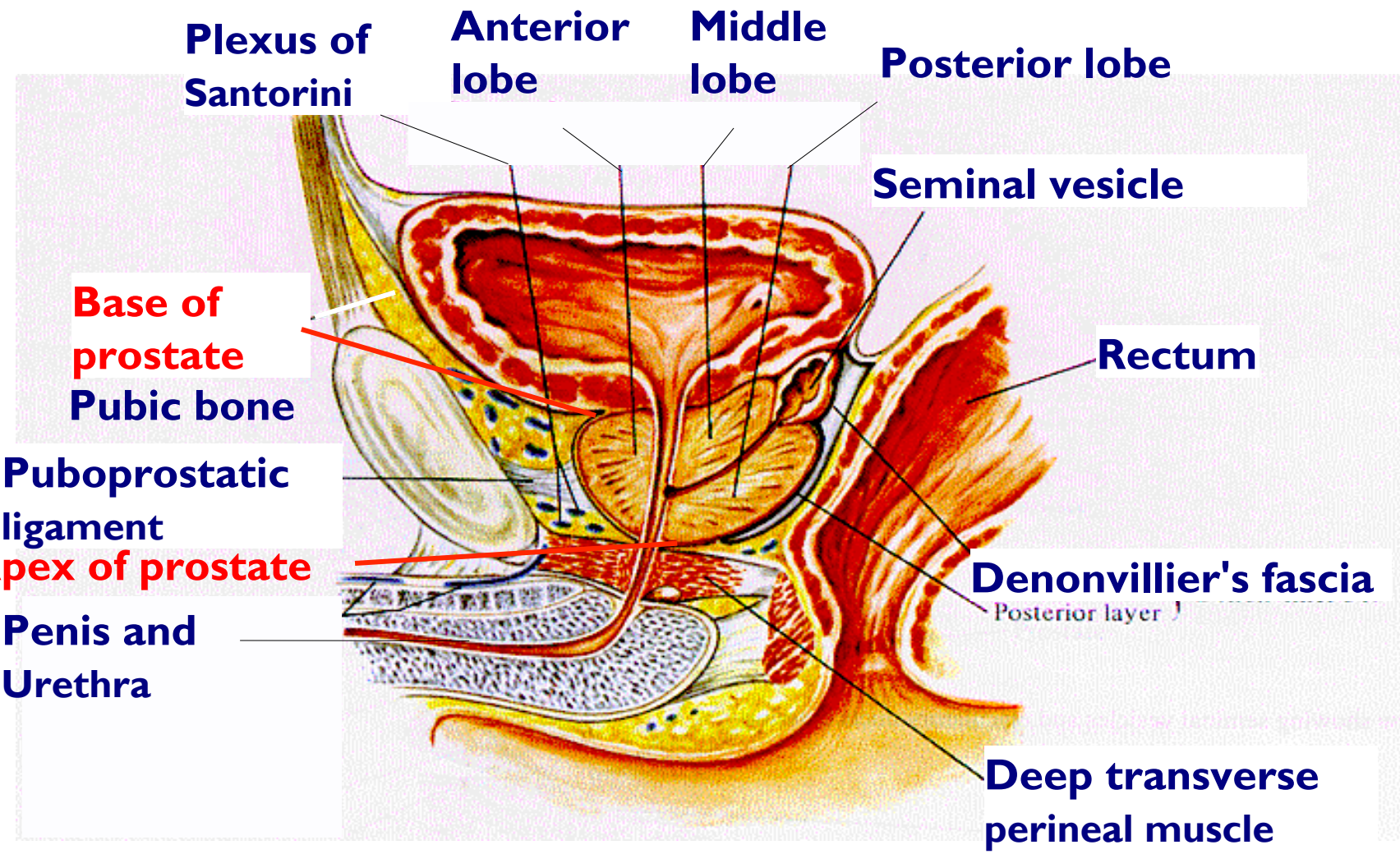

Clitoris
Labia minora
Urethra
Skene's glands
Vagina
Bartholin's glands

Four Areas of the Prostate

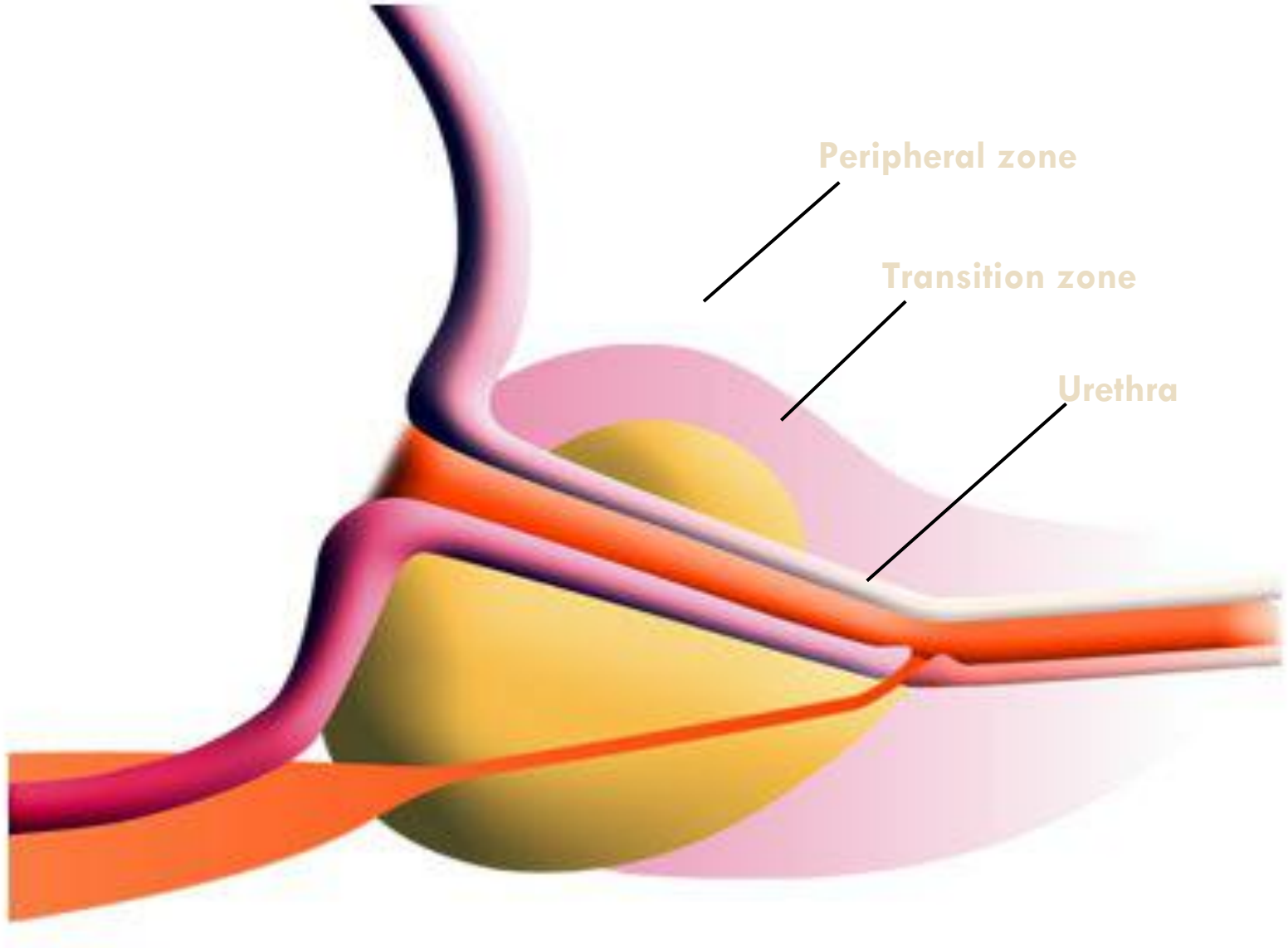


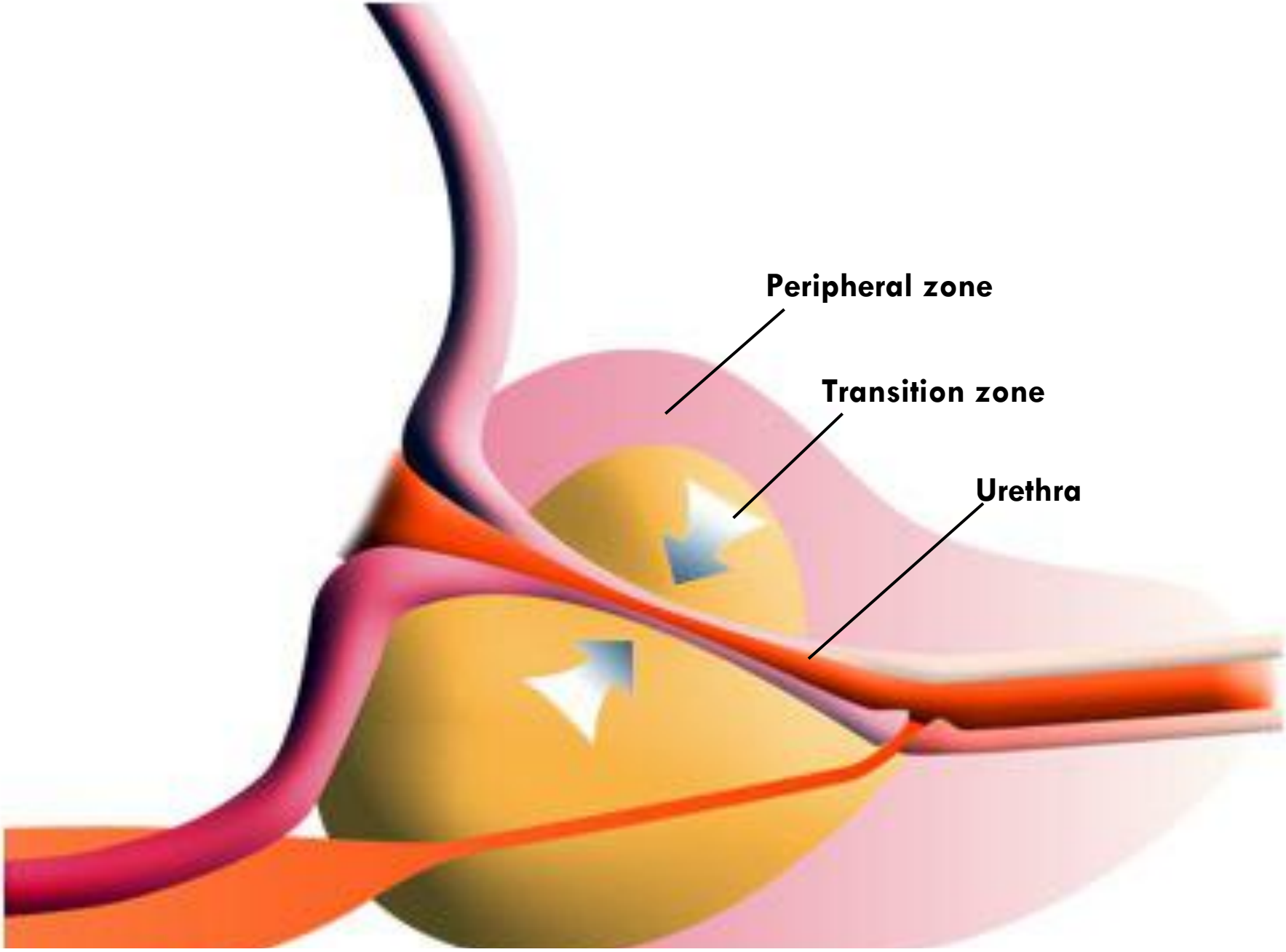
- Transition Zone
- Peripheral Zone
- Anterior Zone
- Central Zone

Sagittal View of the Prostate

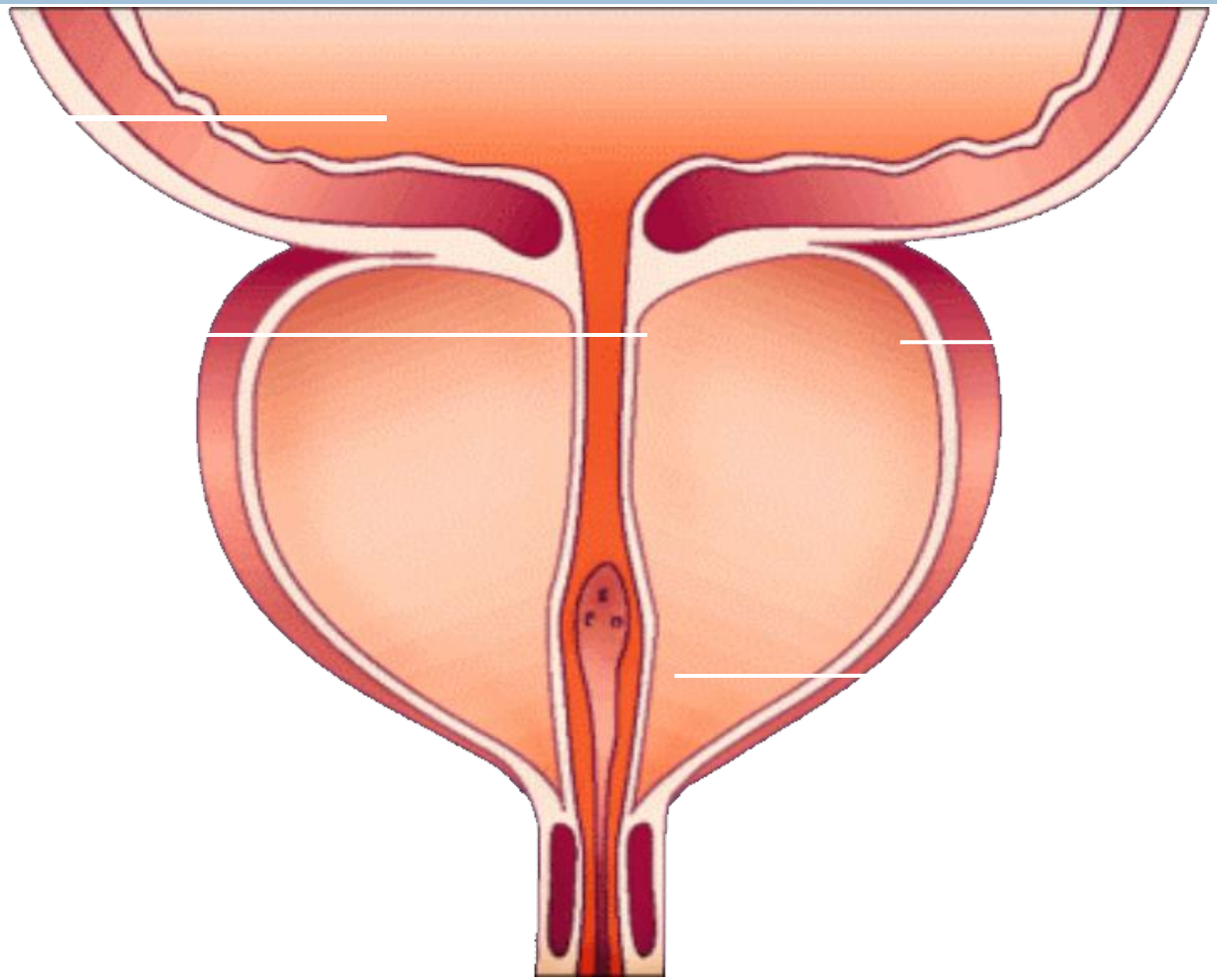


What is Benign Prostatic Hyperplasia?




Peripheral zone
Transition zone
Urethra

Anatomy of the prostate gland



Kirby R et al (Eds) Adapted from Textbook of BPH 1996

Arterial supply

From the anterior division of the internal iliac artery

- ❖Inferior vesical artery,
- ❖Middle rectal artery
- ❖Internal pudendal artery originates (hypogastric) artery.

The capsular artery is the second main branch of the prostate. Supply the glandular tissue.

Venous drainage

Prostatic plexus of veins

Valveless communication exists between the prostatic and vertebral plexus through which prostatic carcinoma spread to vertebral column and to skull

Innervations

❖from pelvic plexuses formed by the parasympathetic, visceral, efferent, and preganglionic fibers that arise from the sacral levels(S2-S4)

❖sympathetic fibers from the thoracolumbar levels (L1-L2).

❖The pudendal nerve is the major nerve supply leading to Somatic innervations of the striated sphincter and the levator ani. The preprostatic sphincter and the vesicle neck or internal sphincter is under alpha-adrenergic control.

Lymphatic drainage

❖Obturator and the internal iliac lymphatic channels.

❖external iliac, presacral, and the para-aortic lymph nodes.

what causes BPH?

- BPH is part of the natural aging process (increase in androgen receptor)
- Dihydrotestosterone (DHT) may play a role
- BPH **cannot** be prevented
- BPH **can** be treated

Aetiology of BPH –principal hypotheses

- Androgens and age play a central role
- Several hypotheses explain the pathogenesis of BPH:
  - dihydrotestosterone (DHT) hypothesis
  - oestrogen–testosterone imbalance
  - reduced cell death

BENIGN PROSTATIC HYPERPLASIA

- BPH arises from the peri-urethral glands in the transition zone

- BPH occurs in almost all men who have normal serum testosterone level and who lived long enough

- Testosterone (T) ---under the effect of 5-alpha reductase enzyme in the stromal cells is converted to Dihydrotestosterone (DHT) which leads to glandular epithelial proliferation.

BENIGN PROSTATIC HYPERPLASIA

Pathology

I- Microscopy

Hyperplasia and hypertrophy of the glands + smooth muscles + fibrous tissue stroma

- Mainly glandular------- (soft)
- Mainly fibrous stroma------ (firm)

II- Gross

Pattern:

* Monolobar = Middle lobe

*Bilobar = 2 lateral lobes

*Trilobar = Middle + 2 Lateral lobes

The hyperplastic lobes outwardly compress the surrounding zones→ Surgical capsule with a plane of cleavage in between

BENIGN PROSTATIC HYPERPLASIA

Pathophysiology of obstruction:

I- Static component

- Bulk of the gland elongation, compression and angulations of the prostatic urethra
- Middle lobe obstruction of the bladder neck (ball-valve)

II- Dynamic component

- Prostatic smooth muscle are innervated by alpha-adrenergic fibers
- Atony of the detrusor muscle by long standing obstruction resulting in chronic retention

What's LUTS?

Voiding (obstructive) symptoms

- Hesitancy
- Weak stream
- Straining to pass urine
- Prolonged micturition
- Feeling of incomplete bladder emptying
- Urinary retention

Storage (irritative or filling) symptoms

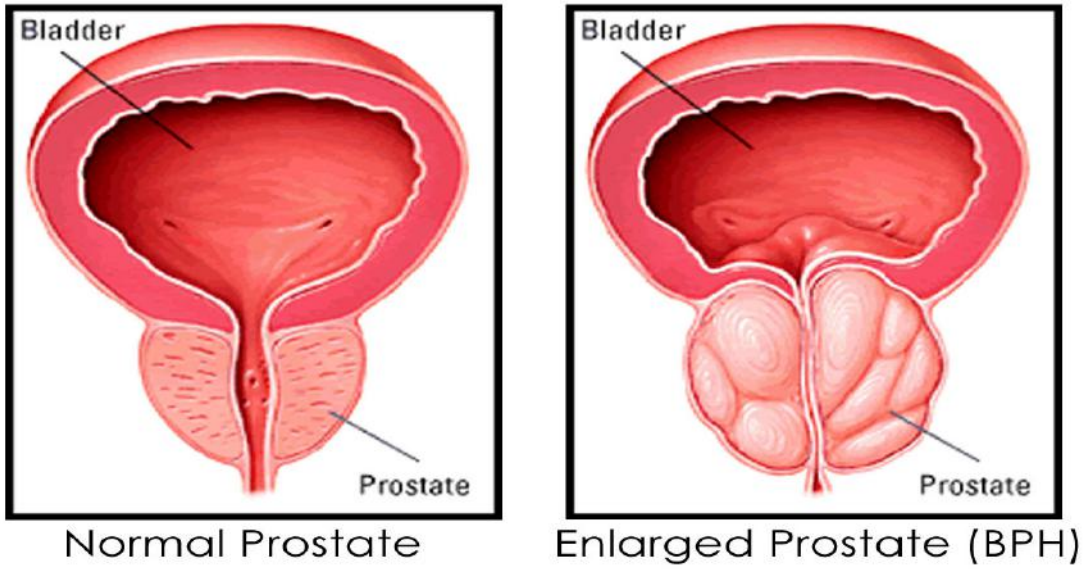
- Urgency
- Frequency
- Nocturia
- Urge incontinence

LUTS is not specific to BPH – not everyone with LUTS has BPH and not everyone with BPH has LUTS

common symptoms

- decrease in the urinary stream
- Dribbling or leaking after urination
- Intermittency
- Hesitancy
- Pain or burning during urination
- Feeling that the bladder never completely empties

what causes these symptoms?

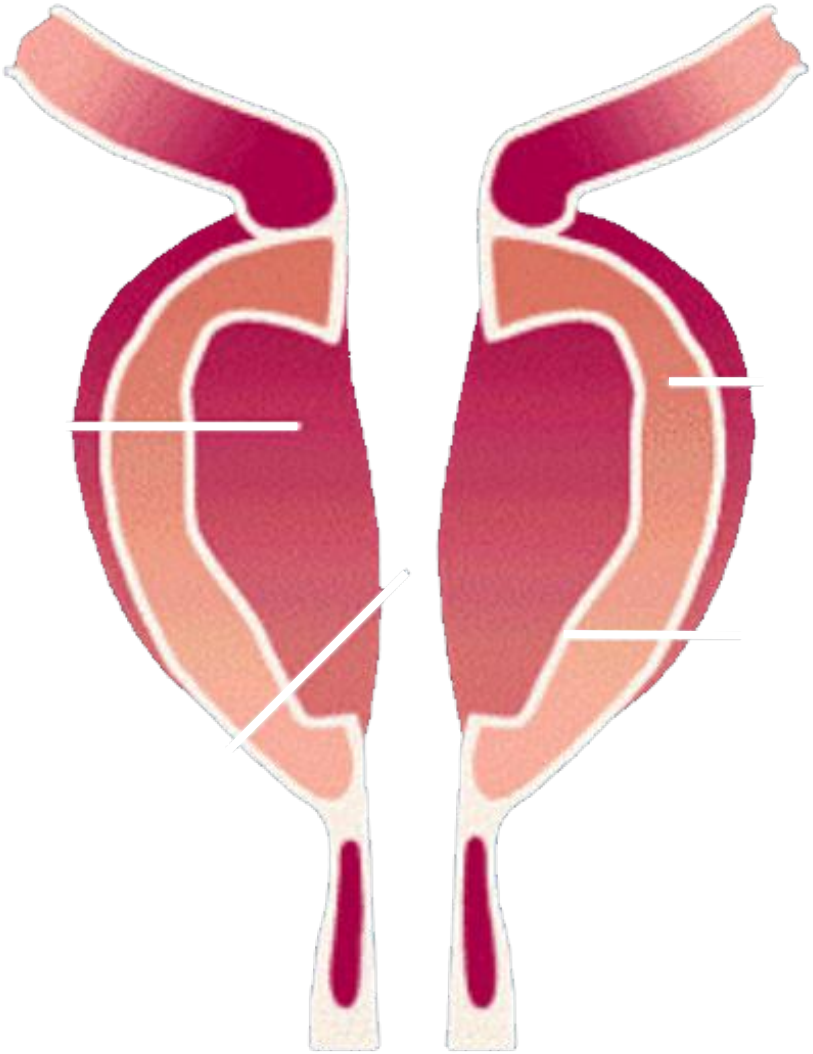


Normal Prostate

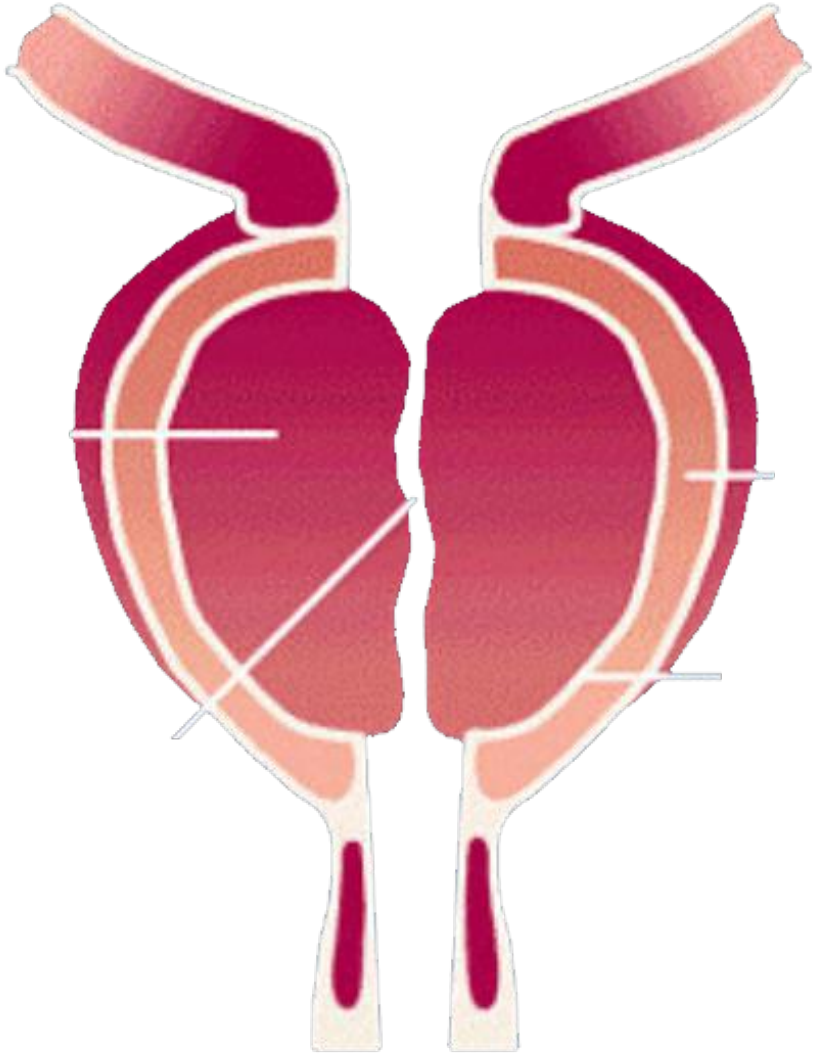
Enlarged Prostate (BPH)

- Prostate grows with age
- Pressure on the urethra restricts urine flow

Development of BPH: Intermediate

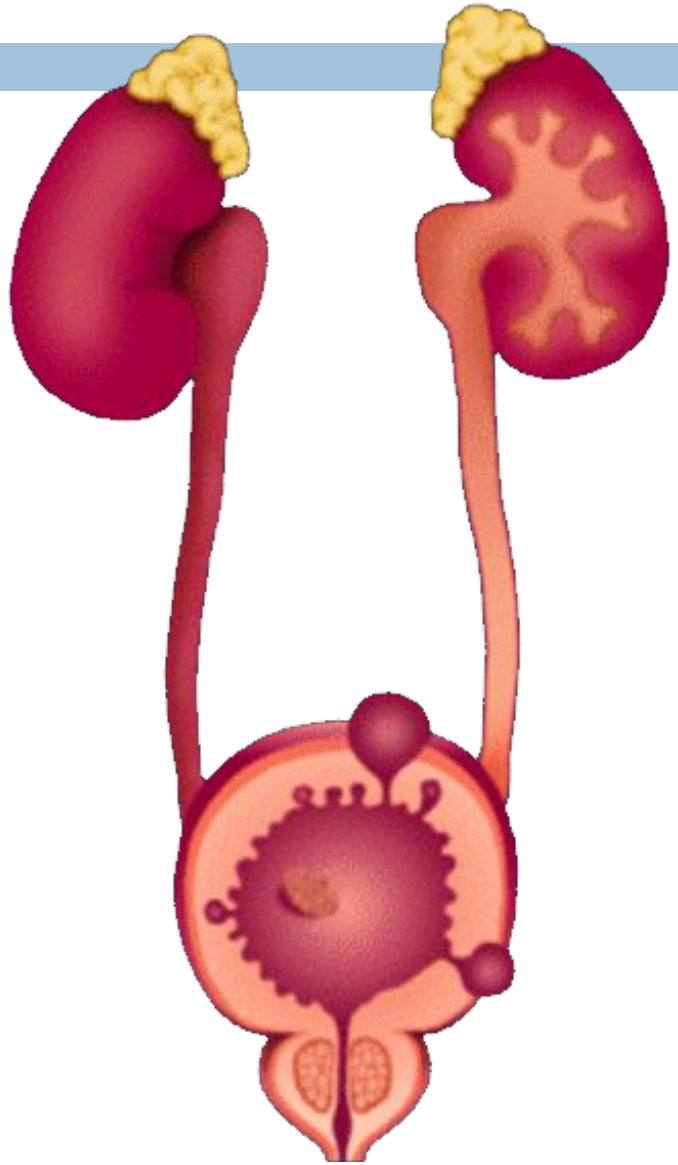


Development of BPH: Late



Other urinary changes

- Irreversible bladder changes
- Thickening of the bladder wall
- Recurrent haematuria
- Bladder diverticulum formation
- Repeat urinary tract infections
- Bladder stone formation
- Upper tract dilatation
- Renal impairment



BENIGN PROSTATIC HYPERPLASIA

Differential Diagnosis

Meatal stenosis

Urethral stricture

Prostatic cancer

Bladder neck fibrosis

Drugs (parasympatholytic and sympathomimetics)

Neurologic lesions

Diagnosis of BPH

- Symptom assessment
  - the International Prostate Symptom Score (IPSS) is recommended as it is used worldwide
  - IPSS is based on a survey and questionnaire developed by the American Urological Association (AUA). It contains:
    - seven questions about the severity of symptoms; total score 0–7 (mild), 8–19 (moderate), 20–35 (severe)
    - eighth standalone question on QoL
- Digital rectal examination(DRE)
  - inaccurate for size but can detect shape and consistency
- PV determination- ultrasonography

Table 40–3. AUA-7 SYMPTOM INDEX FOR BENIGN PROSTATIC HYPERPLASIA

	Not at All	Less Than 1 Time in 5	Less Than Half the Time	About Half the Time	More Than Half the Time	Almost Always
1. Over the past month, how often have you had a sensation of not emptying your bladder completely after you finished urinating?	0	1	2	3	4	5
2. Over the past month, how often have you had to urinate again less than 2 hours after you finished urinating?	0	1	2	3	4	5
3. Over the past month, how often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5
4. Over the past month, how often have you found it difficult to postpone urination?	0	1	2	3	4	5
5. Over the past month, how often have you had a weak urinary stream?	0	1	2	3	4	5
6. Over the past month, how often have you had to push or strain to begin urination?	0	1	2	3	4	5
7. Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the morning?	None	1 time	2 times	3 times	4 times	5 or more times

AUA Symptom Score = sum of questions A1–A7 = _____

Modified from McConnell JD, Barry D, Bruskewitz RC, et al: Benign prostatic hyperplasia: Diagnosis and treatment. Clinical practice guideline. Agency for Health Care and Policy Research, Publication No. 94-0582, Feb 1994.

Diagnosis of BPH

- Urodynamic analysis
  - Q_{max} >15mL/second is usual in asymptomatic men from 25 to more than 60 years of age
- Measurement of prostate-specific antigen (PSA)
  - high correlation between PSA and PV, specifically TZV
  - men with larger prostates have higher PSA levels[1]
  - PSA is a predictor of disease progression and screening tool for CaP
  - as PSA values tend to increase with increasing PV and increasing age, PSA may be used as a prognostic marker for BPH

BENIGN PROSTATIC HYPERPLASIA

Symptoms

I- Lower urinary tract symptoms (LUTs)

A. Obstructive symptoms

- Hesitancy
- Weak urinary stream
- Straining during urination.
- Sense of incomplete emptying
- Terminal dribbling

B. Irritative symptoms

- Frequency
- Urgency
- Urge incontinence

II- Hematuria

III- Complications

Retention
Infection
Bladder stone.
Symptoms of renal failure (in patients with chronic retention).

BENIGN PROSTATIC HYPERPLASIA

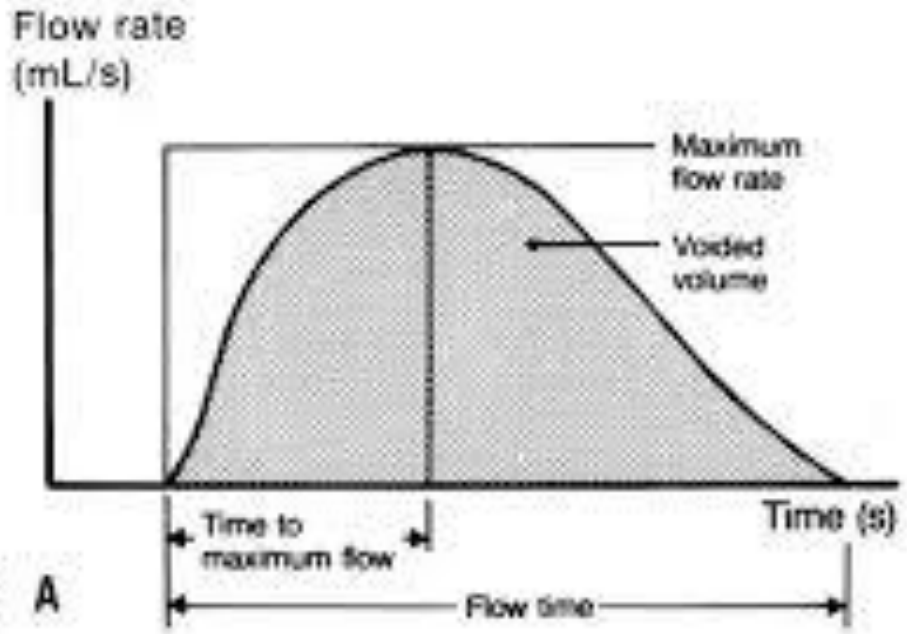
Signs

- Elderly Male
- DRE: Size- Shape- Consistency- symmetry
- Suprapubic Area (urine retention)
- Renal mass (hydronephrosis)
- Hernia orfices (straining)
- Neurological examination (S2,3,4)
- Signs of renal failure (late).

BENIGN PROSTATIC HYPERPLASIA

- **Investigations:**
- ***I- Uroflowmetry***
- - Simple and non-invasive.
- - Normal maximum flow rate (Q-Max) >18 ml/second
- -Maximum Flow Rate < 10ml/Sec is indicative of obstruction &/or weak detrusor muscle
- ***II- Laboratory Investigations***
- - Urinalysis
- - Serum creatinine
- - Serum PSA (prostatic specific antigen, <4ng/ml).

Uroflowmetry



A

BENIGN PROSTATIC HYPERPLASIA

III- Diagnostic Imaging

A. U/S Abdominal

- Gives an idea about kidneys, post voiding residual, size of the prostate and other pathology ,e.g. bladder stone, diverticulum

B. Plain KUB and IVU

Stones

Upper tract affection

Smooth basal filling defect

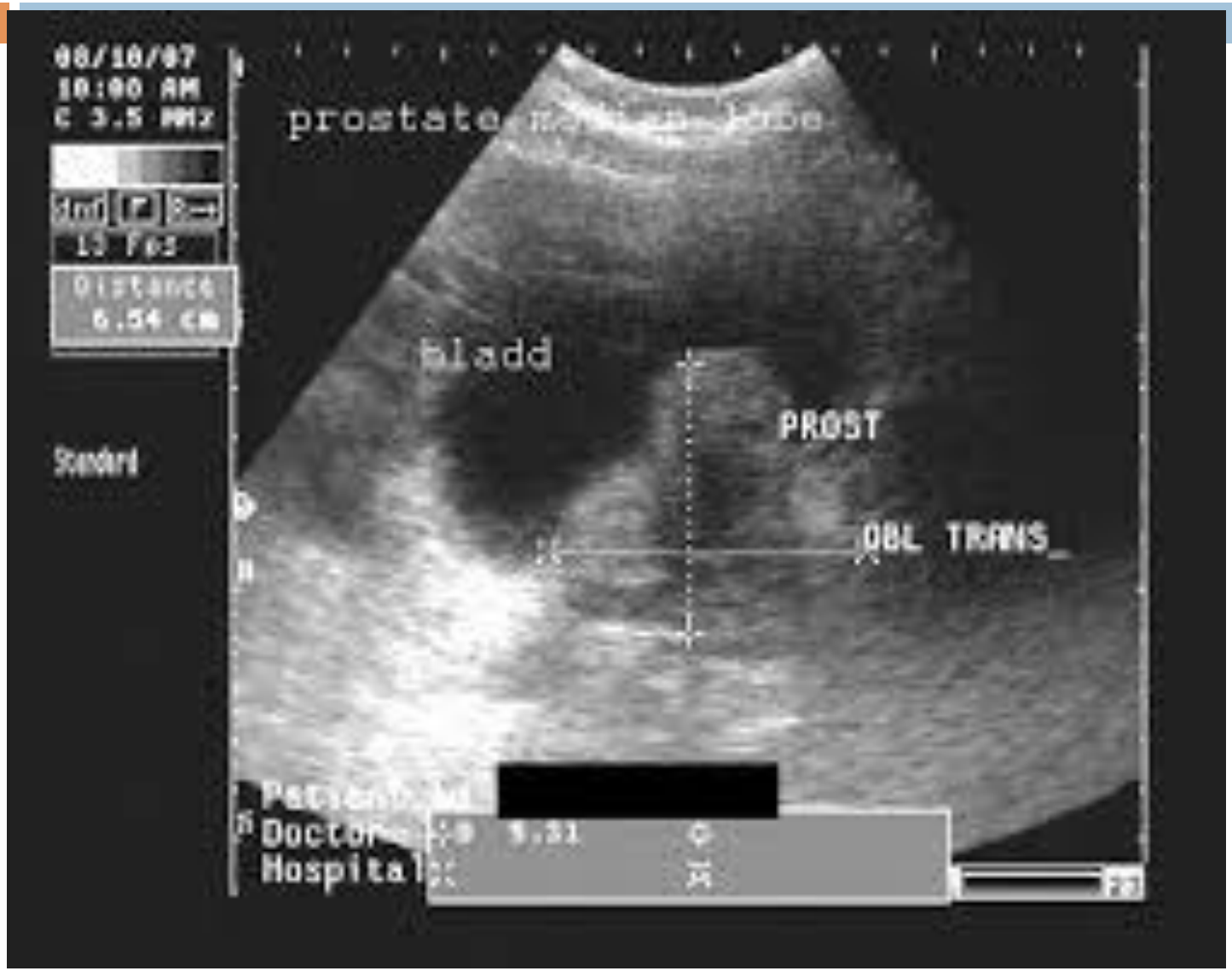
Fish hook of the lower ureters

Bladder trabeculations, cellules, and diverticula

Post-voiding film

BENIGN PROSTATIC HYPERPLASIA


10/8/1 PRS 4+
0 C 0
0
5
10
15
0
5
10
15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prostate
Bladd
PROST
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Standard

BENIGN PROSTATIC HYPERPLASIA

IV- Cystourethroscopy (prior to surgery)

Degree of middle &/or lateral lobe enlargement Hematuria

Bladder stone

Associated pathology

Urethral stricture

What are the complications of benign prostatic hyperplasia?

What are the complications of benign prostatic hyperplasia?

The complications of benign prostatic hyperplasia may inclu

- acute urinary retention
- chronic, or long lasting, urinary retention
- blood in the urine
- urinary tract infections (UTIs)
- bladder damage
- kidney damage
- bladder stones

when should BPH be treated?

BPH needs to be treated ONLY IF:

- The symptoms are severe enough to bother patient and affect the quality of life
- Renal insufficiency
- Frequent urinary tract infections

treatment options

- Medication
- MinimL Invasive treatmen
- Surgical approaches

BENIGN PROSTATIC HYPERPLASIA

Treatment

I- Medical Treatment

Watchful waiting

Phytotherapy e.g. pumpkin seed oil

Alpha-blockers e. g. doxazosin, Terazocin, Tamsolucin

5-alpha reductase inhibitors e. g. finastride, Dutasteride.

medication

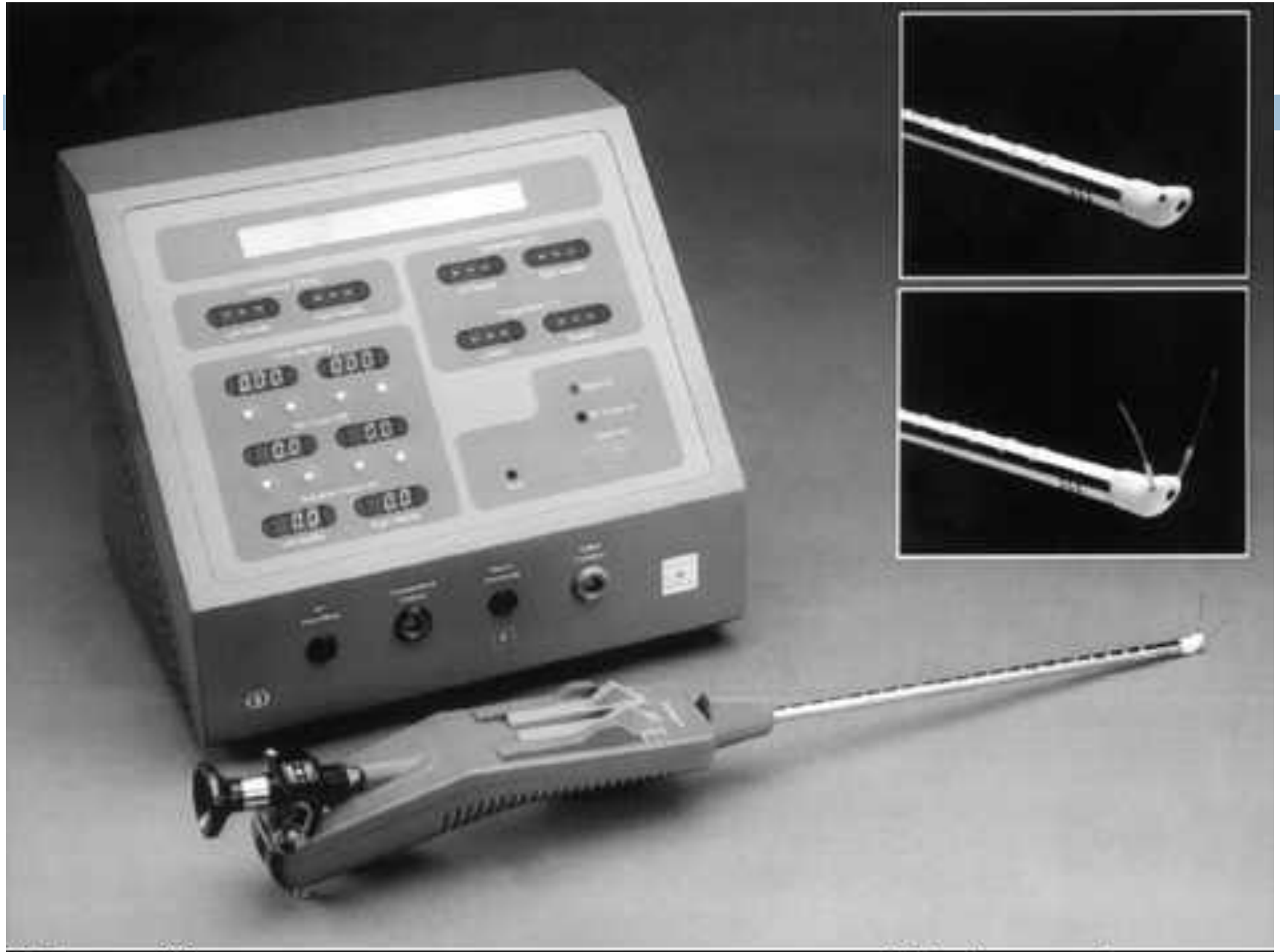
- **First line of defense against bothersome urinary symptoms**
  - Manage the condition - don't fix it
- **Two major types:**
  - **(Alpha-1-blocker)** - relax the prostate and provide a larger urethral opening (prazosin,terazosin)
- **Shrink the prostate gland (5-alpha reductase inhibitor)** (finasteride)

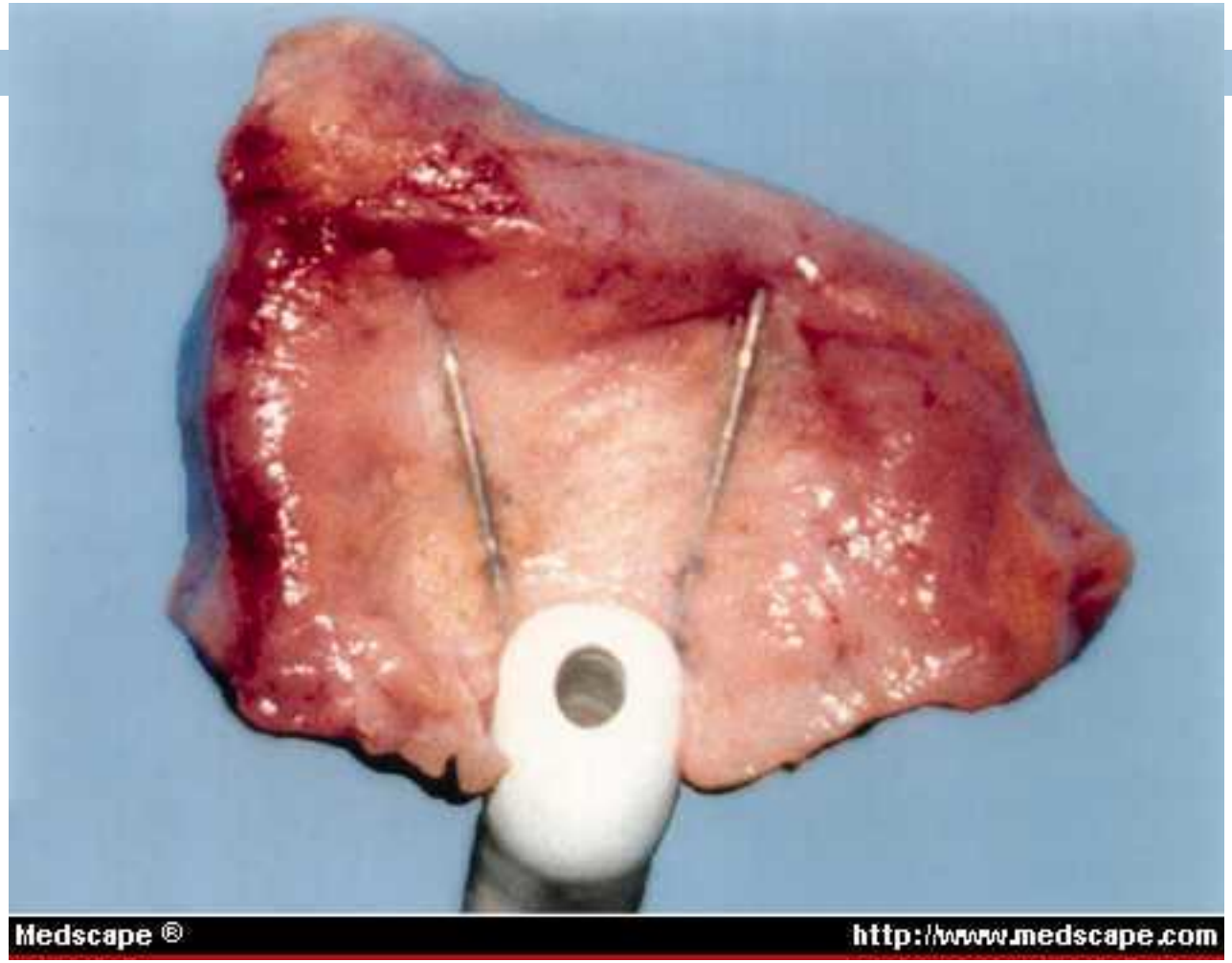
possible side effects of medication

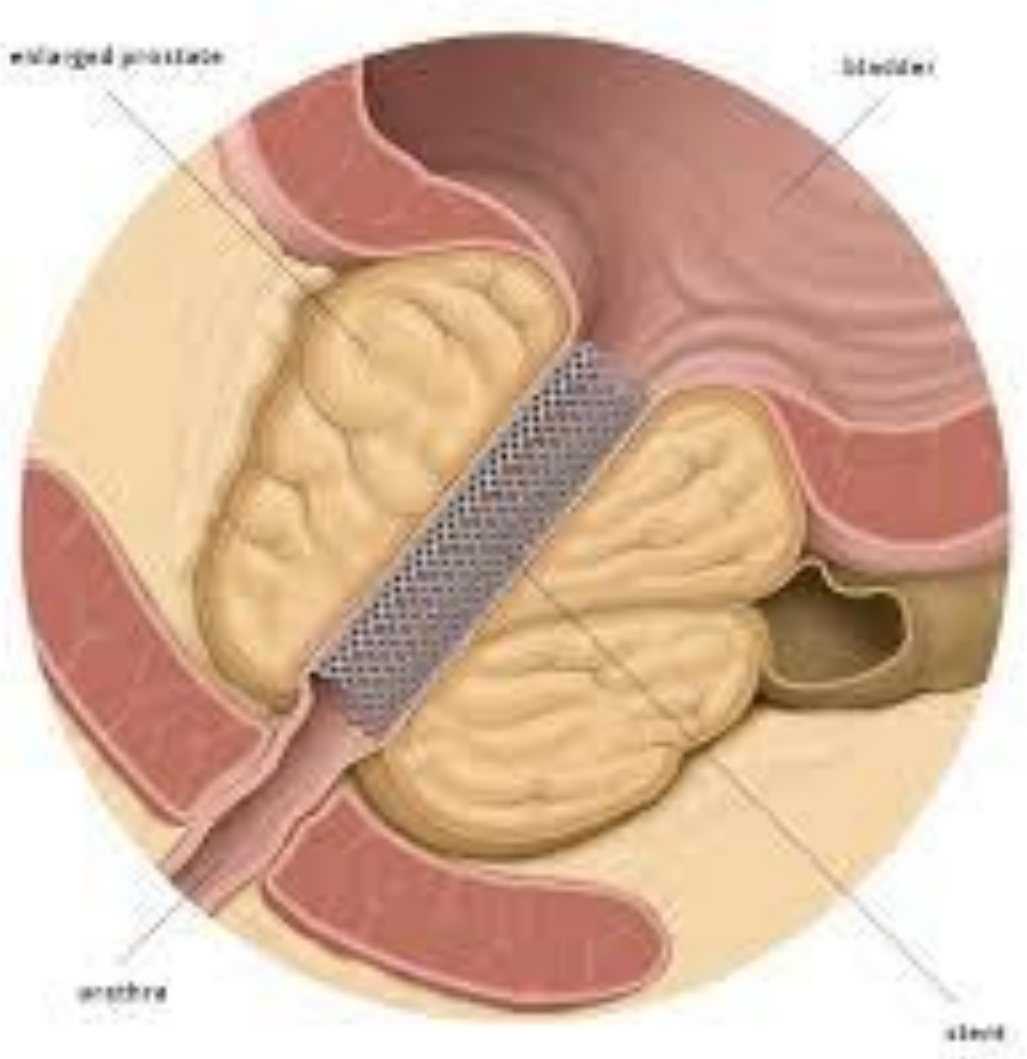
- Impotence
- Dizziness
- Headache
- Fatigue
- Loss of sexual drive

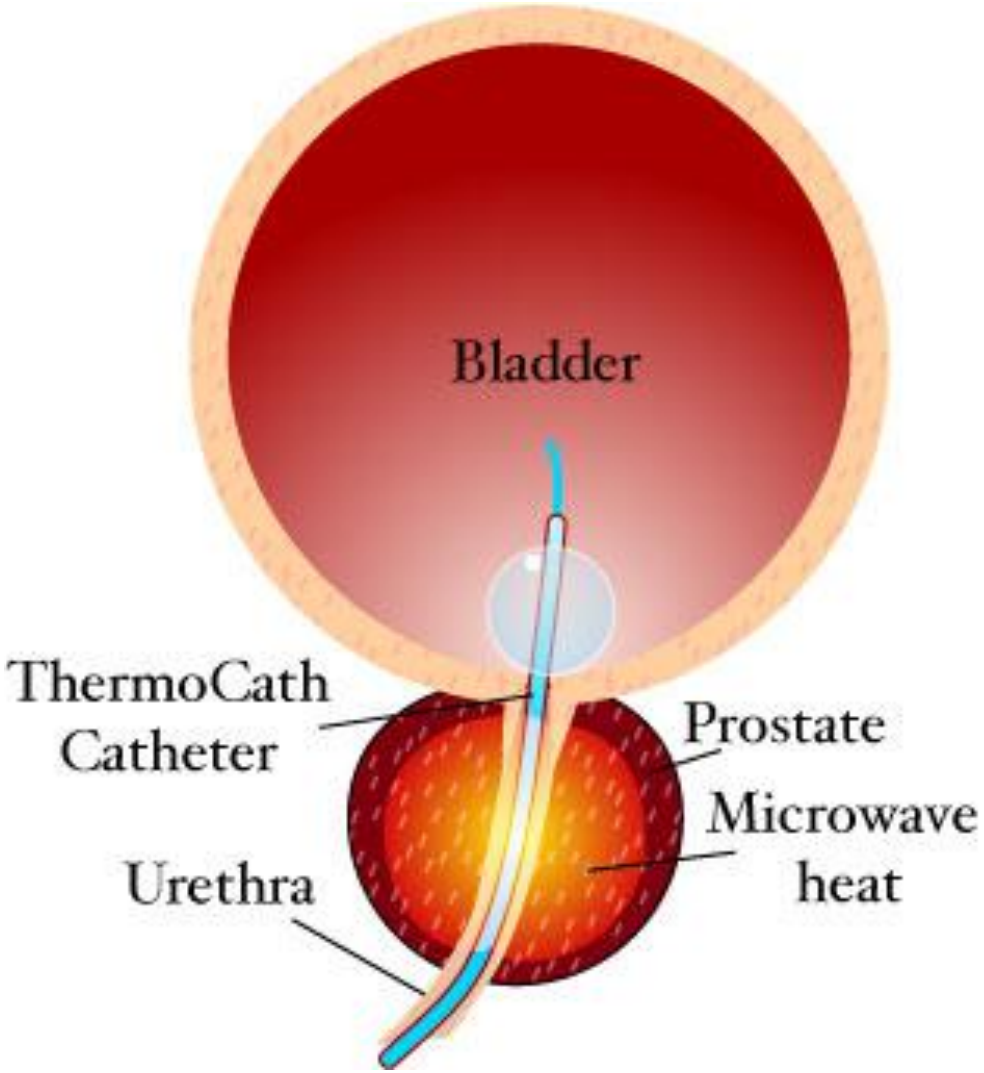
Minimally Invasive Procedures

- transurethral needle ablation
- transurethral microwave thermotherapy
- high-intensity focused ultrasound
- transurethral electrovaporization
- prostatic stent insertion




Medscape ®
http://www.medscape.com

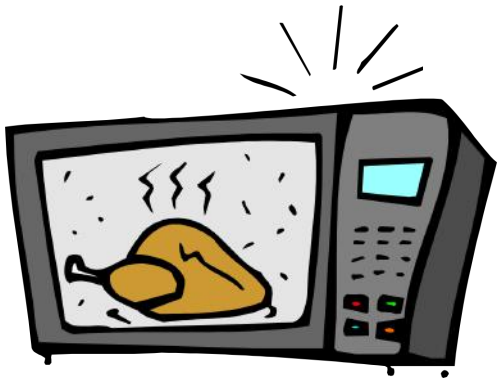

enlarged prostate
bladder
urethra


Bladder
ThermoCath
Catheter
Prostate
Microwave
heat
Urethra

heat therapies

- Destroy prostate tissue with heat

- Tissue is left in the body and is expelled over time (called sloughing)
  - Transurethral Microwave Therapy (TUMT)
  - Transurethral Needle Ablation (TUNA®)
  - Interstitial Laser Coagulation (ILC)
  - Water Induced Thermotherapy (WIT)



possible side effects of

heat therapies

- Urinary Tract Infection
- Impotence
- Incontinence

surgical treatment

BENIGN PROSTATIC HYPERPLASIA

Indications of surgery

1. Repeated attacks of acute urine retention
2. Chronic retention, hydronephrosis
3. Hematuria (repeated significant)
4. Recurrent UTI
5. Bladder stone
6. Severe obstructive symptoms
7. Poor response to medical therapy
8. Side effects of medical treatment.

BENIGN PROSTATIC HYPERPLASIA

II- Surgical treatment

A. Transurethral resection of the prostate (TURP):

This is the gold standard option.

B. Open prostatectomy:

Retropubic, transvesical and perineal routes

N.B. *Histopathological examination.*

SURGICAL PROCEDURES

- TURP
- Transurethral electro-vaporisation
- Transurethral incision
- Transurethral laser technique(holmium,KTP)
- Balloon dilatation
- Prostate stents
- Prostatectomy:- suprapubic,retropubic,perineal
- Laproscopic

Complications of prostatectomy

A- Complications of anesthesia

B- intra-operative

- Bleeding
- TUR syndrome
- Trauma (urethra, B.N., bladder)

C- Immediate post-operative

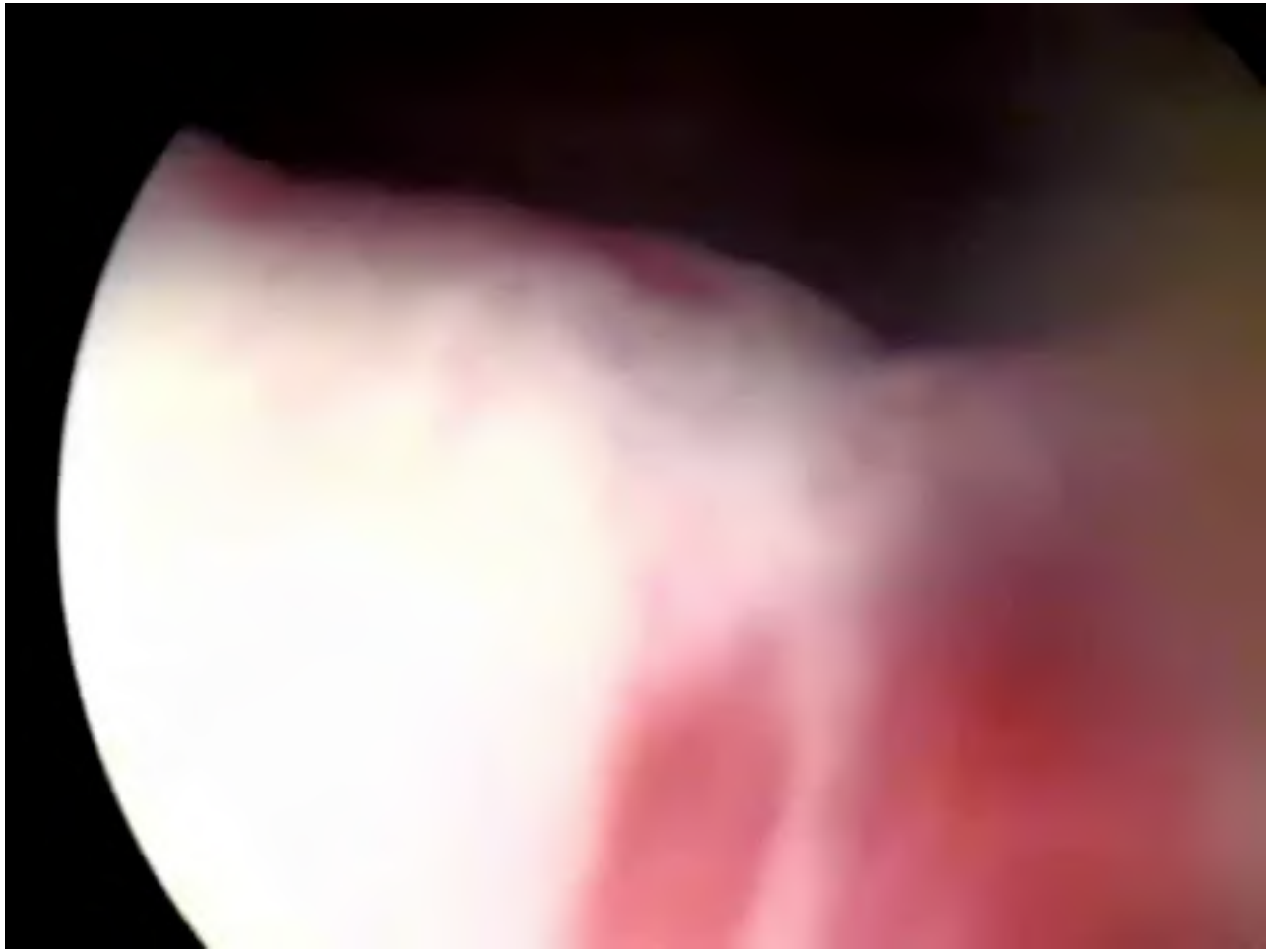
- Bleeding primary, reaction
- Problems with catheters
- Re-retention

D- Delayed post-operative

- Bleeding secondary
- Infection UTI, Wound
- Urine leak
- Urine incontinence
- Urethral stricture

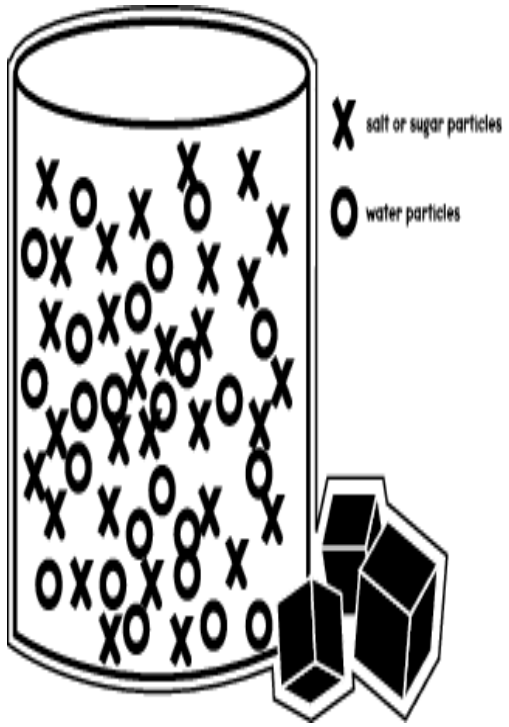
COMPLICATIONS

- TURP can be associated with a number of complications:
  - TURP Syndrome (2%)
  - Hemorrhage
  - Bladder perforation (1%)
  - Hypothermia
  - Septicemia (6%)
  - DIC
- The main challenges are blood loss and TURP Syndrome due to excessive absorption of irrigant fluid



TURP SYNDROME: DEFINITION

- TURP syndrome:
- The syndrome is characterized by
  - hypervolemia,
  - hyponatremia
  - hypo-osmolarity



the "gold standard"- TURP

Benefits

- Widely available
- Effective
- Long lasting

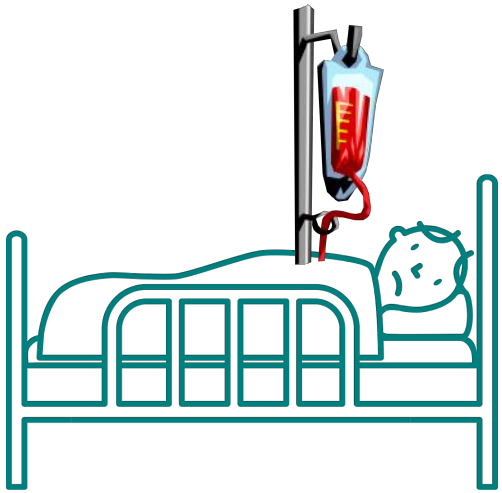
Disadvantages

- Greater risk of side effects and complications
- 1-4 days hospital stay
- 1-3 days catheter
- 4-6 week recovery

possible side effects of

TURP

- Impotence
- Incontinence
- Bleeding
- Electrolyte imbalance
- (TUR Syndrome)



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