

# **Benign Prostate Disorders**

**Frank P. Begun, M.D.**

**Associate Professor, Urology  
Medical Director, Urological Services at OSU  
East Hospital  
The Ohio State University**

## **Objectives/Goals**

- **To understand the causes of BPH**
- **To review the symptoms related to BPH**
- **To gain knowledge of the different forms of treatment for bladder outlet obstruction due to BPH**

**Medical management**

**Surgical options**

**Other treatments**

# **Objectives**

- **To review the causes and symptoms of prostatitis**
- **To understand the diagnosis and management of prostatitis and Pelvic Pain Syndrome**

## **Benign Prostate Disorders**

- **Benign Prostatic Hyperplasia (BPH)**
- **Prostatitis**
- **Pelvic Pain Syndrome (PPS)**

## **BPH/BPE**

- **Epidemiology**
- **Etiology**
- **Symptoms**
- **Objective Data**
- **Nonsurgical/Medical Management**
- **Surgical Management**

## **BPH**

- **Exact molecular etiology is unknown**
- **Androgens and estrogens**
- **Growth factors**
- **Cell-cell interactions**
- **Impaired programmed cell death (apoptosis)**
- **Neurotransmitters**

## **BPH Role of Androgens**

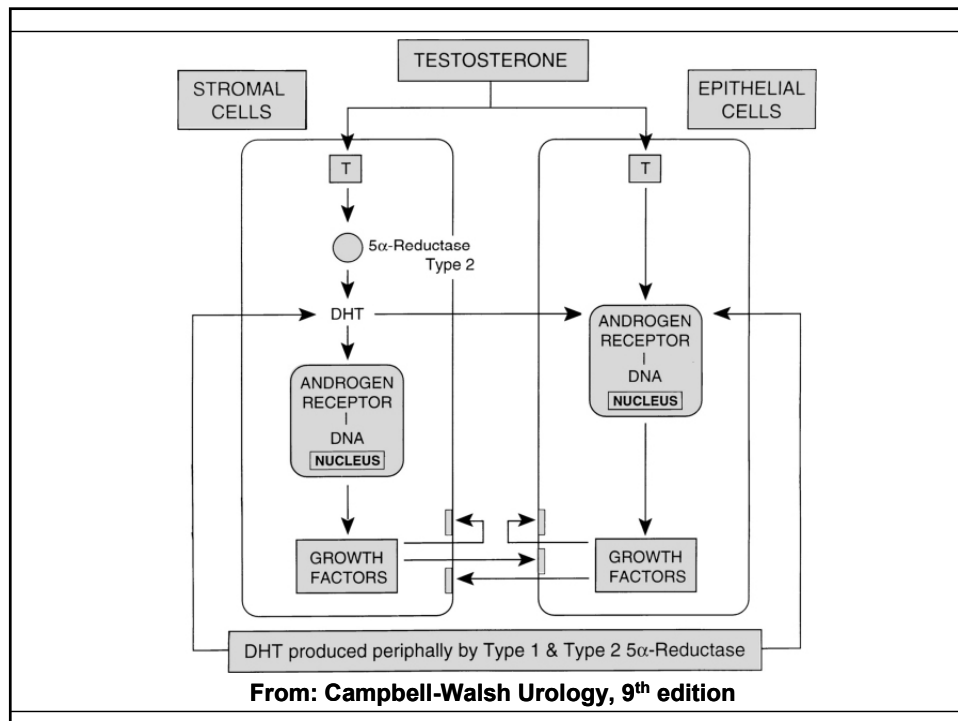
- **Post natal androgen surges are critical**
- **Imprinting of prostate cells**
- **Affects maturation process and cell death**
- **Necessary during puberty and aging**
- **Prostatic levels of dihydrotestosterone (DHT) and androgen receptors play a key role**

## **BPH Role of Androgens**

- **Prostate retains ability to respond to androgens throughout ones life**
- **Concentration of androgens does not increase with age**
- **Stromal cell – 5 alpha reductase Type 2 interaction seems to be key event in the development of BPH**
- **Role of estrogens is unclear**

# BPH

- **Stromal events induce glandular proliferation**
- **Interaction between growth factors, GF receptors, and steroid hormones**
- **Programmed cell death/apoptosis**



## **BPH Other Factors**

- **Inheritable component: earlier onset, larger gland size, autosomal dominant**
- **Sympathetic nerve pathways**
- **Inflammation**
- **Reflux**
- **Environmental**

## **Pathophysiology of Obstruction**

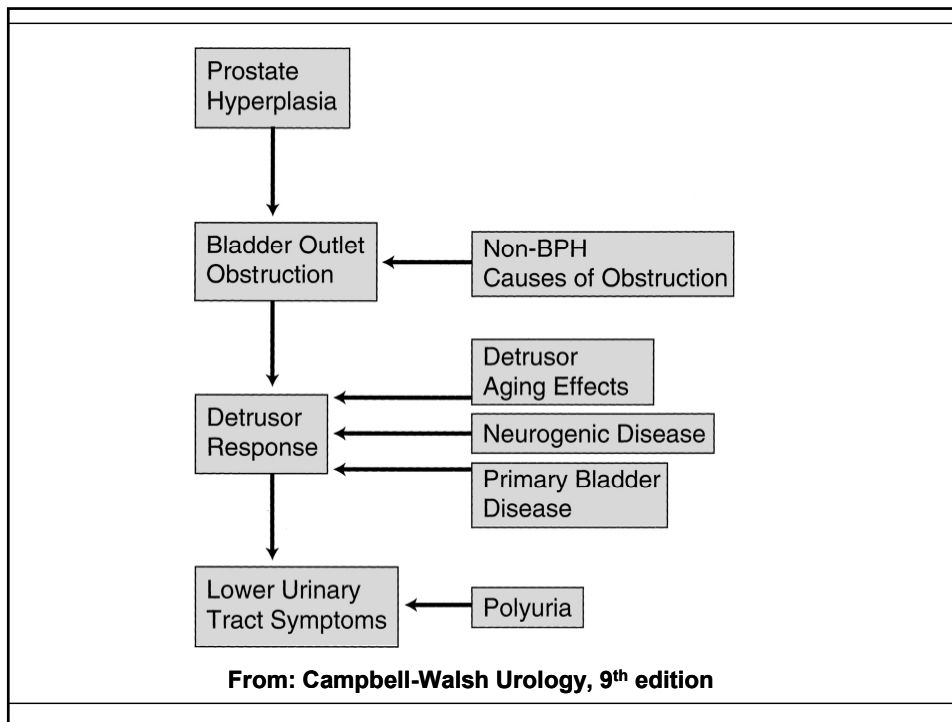
- **BPH develops in the Transition and Periurethral Zones : central prostate**
- **Prostate Cancer develops in the Peripheral Zone : posterior prostate**
- **Static component of obstruction**
- **Dynamic component of obstruction**

# **BPH**

- **Obstructive uropathy/Urinary obstruction**
- **Bladder outlet obstruction (BOO)**
- **Lower Urinary Tract Sx (LUTS)**
- **Prostatism**
  
- **BPH  $\neq$  Urinary obstruction**
- **Urinary obstruction  $\neq$  BPH**

# **BPE**

- **Explanation of increased urethral resistance due to BPE is too simplistic**
- **Must factor in age related detrusor and bladder neck dysfunction**
- **Static and dynamic factors**



## Size Doesn't Matter

- Not critical when deciding whether or not to Rx
- Not well correlated with Sx severity, degree of obstruction, or Rx outcome
- Important wrt deciding mode of Rx
- However, size does correlate with disease progression and risk of acute retention



# **BPH**

- **Microscopic BPH: stromal and epithelial cellular proliferation**
- **Macroscopic BPH: increase in the size of the prostate as a result of microscopic BPH (BPE)**
- **Clinical BPH: signs and Sx of obstruction due to BPE (LUTS, BOO, Prostatism)**

## **Clinical Manifestations of BPH**

- **Hematuria**
  - Microscopic**
  - Gross**
- **LUTS**
- **UTI**
- **Urinary retention**
- **Hydronephrosis**
- **Renal Insufficiency**

# Evaluation

- History
- AUA/IPSS Symptom Score
- DRE
- Urinalysis (r/o UTI)
- Uroflow and Post Void Residual (PVR)
- Imaging : Transrectal U/S (TRUS) with volume measurement
- Urodynamic Testing

## International Prostate Symptom Score (IPSS)

- 7 questions + QOL assessment
- Considered “Gold Standard”
- Not intended to establish the Dx of BPE
- Initial assessment of severity of Sx
- Determinant of Rx response
- Determinant of Sx progression

# IPSS

- **0-7 Mild Sx**  
**8-19 Moderate Sx**  
**20-35 Severe Sx**
- **Degree of “bothersomeness”**
- **Need to consider patient’s lifestyle, performance status**

# Uroflow

- **Non invasive**
- **Inaccurate for voided volumes <150mL**
- **Max flow rate (Qmax)**
- **No definite cutoff as a determinant for Rx**
- **No age or voided volume adjustment**
- **Low flow does not differentiate BOO from detrusor hypocontractility**

## **Post Void Residual (PVR)**

- **High intra-individual variability**
- **Poor correlation with other signs and Sx**
- **Measured by U/S or catheterization**
- **? Predictor of Rx outcome**
- **Increasing PVRs may be an indicator of the need for intervention**

## **Cystoscopy**

- **Not indicated to determine the need for treatment**
- **Poor correlation between visual appearance and treatment outcome**
- **Indicated to determine the most appropriate type of treatment for those who have opted for surgical management**

## **Surgical Rx: Indications**

- **Patient preference**
- **Recurrent urinary retention**
- **Recurrent UTI's**
- **Recurrent gross hematuria**
- **Bladder calculus**
- **Large bladder diverticula**
- **Renal insufficiency due to BPE**

## **Medical Management**

- **Preferred treatment for those men lacking absolute indications for surgical intervention.**
- **US Medicare Database:**
  - 250,000 prostate surgeries in 1987**
  - 116,000 in 1996**
  - 88,000 in 2000**

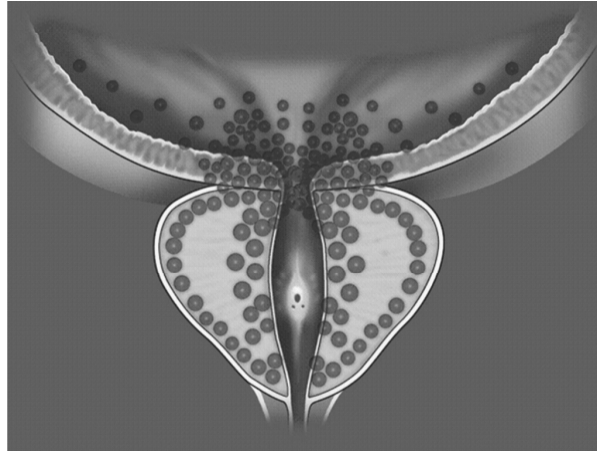
# **Urinary Obstruction**

- **Static Component:**  
BPH/mechanical obstruction
- **Dynamic Component:** smooth muscle function at bladder outlet

# **Nonsurgical Management of BPH**

- **Alpha Adrenergic Blockers**
- **Androgen Suppression/Ablation**
- **Combination Therapy**
- **Aromatase Inhibitors**
- **Phytotherapy**

# Alpha Adrenergic Receptors



From: Campbell-Walsh Urology, 9<sup>th</sup> edition

## Alpha Blocker Therapy

- **Selective  $\alpha_1$  Adrenergic receptor blockade**
- **Several medications available:**
  - Doxazosin (Cardura)**
  - Terazosin (Hytrin)**
  - Tamsulosin (Flomax)**
  - Alfuzosin (Uroxatrol)**

## **Alpha Blocker Therapy Side Effects**

- **Dizziness**
- **Orthostatic hypotension**
- **Fatigue/somnolence**
- **Headache**
- **Rhinitis**
- **Nausea**
- **Retrograde ejaculation**

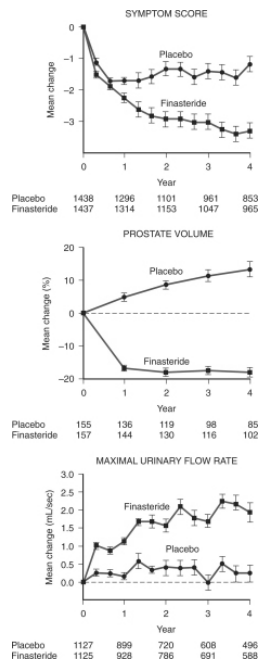
## **Androgen Ablation**

- **Agents causing a loss of Testosterone or DHT action result in a decrease in the volume of the prostate.**
- **Primarily an epithelial regression.**
- **Maximum results occur within 6 months**
- **Treats static component of BPH**
- **5 alpha reductase inhibitors**



# Androgen Ablation

- 5 alpha reductase converts T → DHT
- DHT is predominant intraprostatic androgen
- Finasteride (Proscar) Type 1
- Dutasteride (Avodart) Type 1 and 2
- ~30% volume reduction



From: Campbell-Walsh Urology, 9<sup>th</sup> edition

# **Androgen Ablation**

- **Decreased risk of urinary retention**
- **Decreased need for prostate surgery**
- **Volume reduction of prostate**
- **Can lower PSA – effect on cancer detection**
- **Side effects : impotence**

# **Combination Therapy**

- **Theory: synergistic effects of alpha blocker and antiandrogen**
- **Treats both components of prostate obstruction: static and dynamic**
- **VA Coop Study**

# Phytotherapy

- ***Serenoa repens*** Saw palmetto berry
- *Sabal serrulata* American dwarf palm
- *Hypoxis rooperi* South African star grass
- *Pygeum africanum* African plum tree
- *Urtica dioica* Stinging nettle
- *Secale cereale* Rye pollen
- *Cucurbita pepo* Pumpkin seed
- *Opuntia* Cactus flower
- *Pinus* Pine flower
- *Picea* Spruce

# Phytotherapy

## Dosages of Common Phytotherapeutic Preparations

- ***Serenoa repens* (Permixon) 160 mg bid**
- ***Pygeum africanum* (Tadenan) 50 mg bid**
- ***Secale cereale* (Cernilton) 6 capsules**
- **$\beta$ -Sitosterol (Harzol) 20 mg tid**
- **$\beta$ -Sitosterol (Azuprostat) 65 mg tid**

# **Phytotherapy**

- **Little is know about active compounds**
- **Little is know about dosage**
- **Little is know about mechanism of action**
- **Paucity of double blinded prospective comparative studies**
- **Almost all data is anecdotal.**

# **Surgical Treatment Options**

- **Intraprostatic Stents**
- **Transurethral Needle Ablation (TUNA)**
- **Transurethral Microwave (TUMT)**
- **Transurethral Laser Therapy**
- **TURP : Gold Standard**
- **Transurethral Incision (TUIP)**
- **Transurethral Vaporization**
- **Open Prostatectomy**

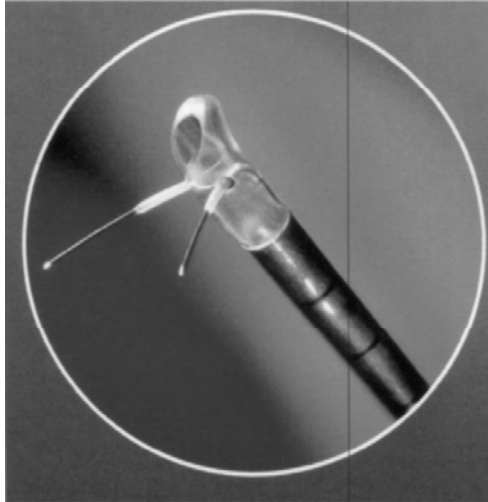
# **Intraprostatic Stents**

- **Primary indication is in patients who are unfit for surgery**
- **Temporary vs. Permanent**
- **Complications: migration, pain**
- **May be useful as a temporary measure after Laser Rx or TUMT**

# **TUNA**

- **Heats prostate tissue to  $>60^{\circ}\text{C}$**
- **Uses radiofrequency (RF) energy**
- **Results in deep tissue necrosis**
- **Sparses the prostatic urethra**
- **Doesn't require anesthesia, therefore, office procedure**

# TUNA

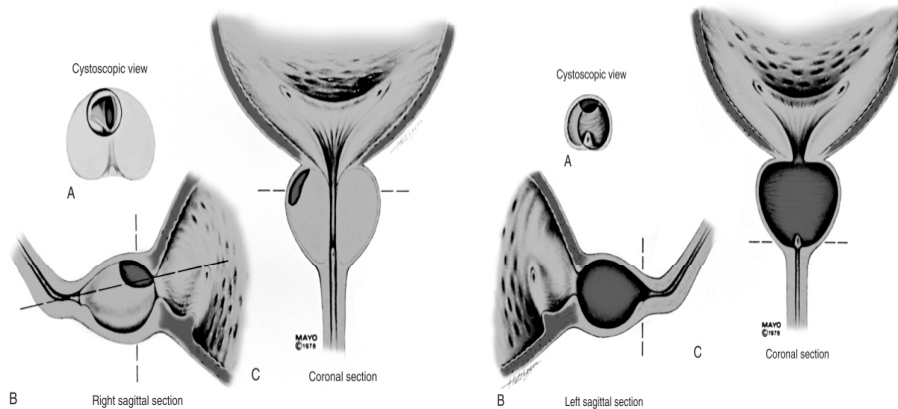


From: Campbell-Walsh Urology, 9<sup>th</sup> edition

## Transurethral Laser Therapy

- Greenlight Laser
- Holmium Laser (HoLEP)

# TURP



From: Campbell-Walsh Urology, 9<sup>th</sup> edition

## Transurethral Vaporization

- Principle similar to TURP
- Removal of central prostate tissue
- No specimen for path analysis
- Less blood loss

## **Benign Prostate Disorders**

- **Prostatitis**
- **Chronic Pelvic Pain Syndrome (CPPS)**

## **Prostatitis**

- **Most common GU Dx in men <50 yrs old**
- **3<sup>rd</sup> most common GU Dx in men >50 yrs**
  - **(BPH, prostate cancer)**
- **2-10% of men have prostatitis-like Sx**
- **9-16% have had the Dx of prostatitis**
- **Accounts for 3-12% of male GU office visits**



# **Prostatitis Classification**

- **Acute Bacterial**
- **Chronic Bacterial**
- **Non-bacterial**
- **Prostatodynia**

## **Prostatitis Classification NIH System**

- **Category I : Acute bacterial**
- **Category II : Chronic bacterial**
- **Category III : Chronic Pelvic Pain Syndrome (CPPS)**
  - **IIIA : Inflammatory CPPS**
  - **IIIB : Non-inflammatory CPPS**
- **Category IV : Asymptomatic**

# **Bacterial Prostatitis**

- **Gold Standard for Dx is the Meares Stamey “4 Glass” collection technique**
- **1<sup>st</sup> described in 1968**
- **Can use pre and post massage “2 Glass” collection**

## **Acute Bacterial Prostatitis/UTI**

- **E coli accounts for 65-80% of infections**
- **Pseudomonas, Klebsiella, Serratia, Enterobacter account for another 10-15%**
- **Enterococci 5-10%**
  
- **Urovirulence : p-fimbri, biofilms**
- **Reflux of urine into the intraprostatic ducts**

## **Bacterial Prostatitis Etiologies**

- **UTI**
- **Transurethral surgery**
- **Indwelling catheter**
- **Dysfunctional voiding/neurogenic bladder**
- **Phimosis**
- **Altered host immune response**
- **Idiopathic**

## **Prostatitis Other Organisms**

- **Corynebacterium**
- **Chlamydia**
- **Ureaplasma**
- **Candida**
- **Trichomonas**

## **Bacterial Prostatitis Treatment**

- **Most antibiotics achieve poor intraprostatic concentrations and yet antibiotics are the mainstay of treatment**
- **Fluoroquinolones**
- **Trimethoprim-sulfa**
- **Macrolides : erythromycin, azithromycin**
- **Tetracycline/doxycycline**
- **No standard treatment durations**

## **Chronic Bacterial Prostatitis Treatment**

- **Duration of optimal Rx is unknown**
- **Sulfa-trimethoprim remains primary agent**
- **30-50% efficacy rates**
- **Fluoroquinolones also useful**
- **1 month vs. 3 month Rx**
- **Differential Dx = CPPS**

# CPPS

- **Absence of bacteria in prostatic secretions**
- **Common presenting Sx is pain**
- **Perineal, suprapubic, penile**
- **Can also be groin, testicular, low back**
- **Pain during and after ejaculation (50%)**
- **Irritative or obstructive voiding Sx**

# CPPS

- **>3 months Sx = CPPS**
- **Sx tend to wax and wane**
- **Up to 33% will resolve over 1 year's time**

# **CPPS**

- **Intraductile reflux**  
**Chemical prostatitis**
- **Immunological Alterations**
- **Neurological**
- **Pelvic floor muscle dysfunction**
- **Psychological factors**

## **CPPS Treatment**

- **40% achieve benefit from antibiotic Rx**
- **Long duration Rx not recommended**
- **Alpha blocker Rx**
- **Anti-inflammatory Rx**
- **Biofeedback**
- **Pelvic muscle relaxation**
- **Antidepressants**
- **Psych**