

Male Reproductive System

Chapter 43

Male Reproductive System

- Testes
- Epididymis, Ductus Deferens, and Ejaculatory Ducts
- Seminal Vesicles, Prostate Gland, and Bulbourethral Glands
- Urethra and Penis

Testes

- Located in Scrotum
- Temperature slightly lower than body temperature
- Spermatogenesis (meiosis)
- Sperm
 - Head- contains the 23 chromosomes
 - Flagellum- provides motility
 - Acrosome- contains enzymes to digest the membrane of the egg cell

Epididymis

- Epididymis- tube (approx. 20 feet long) coils on the posterior side of a testis. Smooth muscle within its wall propels sperm into the ductus deferens.

Ductus Deferens

- Ductus Deferens also referred to as the vas deferens extends from the epididymis in the scrotum through the inguinal canal and into the abdominal cavity.
- Inguinal canal- opening in the abdominal wall for the spermatic cord (connective tissue sheath that contains the ductus deferens, testicular blood vessels, and nerves. Joins with the ejaculatory duct.

Ejaculatory Ducts

- Two ejaculatory ducts
- Each of the ducts receives sperm from the ductus deferens, as well as the secretion from the seminal vesicle on their corresponding sides.
- Both ejaculatory ducts empty into the urethra.

Seminal Vesicles

- A pair of seminal vesicles located posterior to the bladder.
- Alkaline secretion to enhance sperm motility and contains fructose to nourish the sperm.

Prostate Gland

- Muscular gland at the base of the bladder and wraps around the upper part of the urethra.
- Four lobes: anterior, posterior, median, and lateral.
- Prostate secretions are alkaline and contribute to sperm motility.
- Smooth muscle of the prostate contracts during ejaculation, causing the expulsion of semen from the urethra.

Bulbourethral Glands

- Located below the prostate gland.
- Empty into the urethra.
- Alkaline secretion from glands coats the interior of the urethra just before ejaculation to neutralize any acidic urine that might be present.

Alkaline Secretions

- The alkaline secretions of the male reproductive glands enable the sperm to stay viable in the acidic environment of the vagina.
- Acidic pH in the vaginal area due to the normal bacterial flora present
- pH of the semen is 7.4 which permits the sperm to remain motile

Urethra

- Last of the male reproductive ducts
- Longest portion is within the penis

Penis

- External genital organ
- Glans penis- distal end of the penis covered with a fold of skin (prepuce or foreskin)
- Three masses of erectile tissue within the penis
- Each consists of smooth muscle and connective tissue and contains blood sinuses (large, irregular vascular channels)
- Penis is flaccid when the blood flow through the sinuses is minimal

Erection and Ejaculation

- Erection- sexual stimulation causes the arteries to the penis to dilate, the sinuses fill with blood, and the penis becomes erect and firm.
- Parasympathetic impulses
- Ejaculation- brought about by peristalsis of the reproductive ducts and contraction of the prostate gland.

Aging and the Reproductive System

- Testosterone secretion diminishes, but does not stop with aging.
- Sperm production also diminishes with aging, but does not stop.
- Prostatic hypertrophy- enlargement of the prostate gland. Most common reproductive problem for older men.

Male Genitourinary Disorders

Chapter 41

Prostate Gland

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Prostatitis

- Inflammation of the prostate gland
- Can occur at any age after puberty
- Pain, especially when standing
- May lead to difficulty in passing urine

Prostatitis

- Three types:
 - Acute bacterial
 - Chronic bacterial
 - Nonbacterial
- Bacterial prostatitis is most common in older men
- Edema and inflammation can involve a part of the prostate or the entire gland

Prostatitis

- E. coli is the most common bacteria associated with prostatitis
- Causes associated with prostatitis:
 - Bacteria ascending the urethra
 - Infected urine refluxing from the bladder into the prostatic ducts
 - Bacteria in the blood or lymph supply to the gland
 - Surgical instrumentation or other forms of urethral trauma

Prevention

- Regular and complete emptying of the bladder
- Avoid excess in alcohol
- Avoiding high risk sex practices

Signs and Symptoms

- Similar to UTI
 - Urgency
 - Frequency
 - Dysuria
 - Hesitancy
- In addition:
- Low back pain, perineal and postejaculation pain, may be associated with fever and chills

Complications

- Urinary retention
- Temporary impotence
- Rare but can occur:
 - Ascending infection
 - Prostatic abscess
 - Epididymitis
 - Prostatic calculi

Diagnostic Tests

- Digital Rectal Exam (DRE)
- Urine culture
- Expressed prostate secretion (EPS)

Medical Treatment

- Antibiotic therapy
 - Bactrim or Septra for 30 days
 - Chronic prostatitis may need to use other antibiotics
- Anti-inflammatory medications
- Warm sitz baths
- Prostatic massage
- Dietary modifications: decrease intake of spicy foods, decrease or eliminate alcohol

Nursing Interventions

- Assess signs and symptoms
- Obtain history of UTI's or prostate infection in the past
- Assess urinary retention
- Patient education
 - If cause is sexually transmitted organism, such as Chlamydia or Gonococcus- sexual partner needs to be treated also
 - Intercourse should be avoided during treatment
 - Finish all antibiotics

Patient Education

- Causes of prostatitis
- Risk factors: indwelling catheters, poor hygiene, sexual practices, excessive intake of bladder irritants, ignoring s/s of UTI's and poor compliance with antibiotic treatment
- Importance of hand washing and cleaning of sitz bath equipment

Patient Education

- Increase fluid intake (if not contraindicated). Water and cranberry juice encouraged: 2500 to 3000 ml/day.
- Bladder irritants: coffee, tea, cola, and chocolate. Citrus juices and alcohol should be taken in only very limited amounts.
- Empty bladder every 2-3 hours
- Intercourse: relieve prostatic congestion

Benign Prostatic Hypertrophy

- A nonmalignant growth of the prostate that gradually causes urinary obstruction.
- Normal process in older men
- Begins about age 50
- 75% of men over 70 effected
- Does not increase risk of developing cancer of the prostate

Benign Prostatic Hypertrophy

- A slow increase in the number of cells in the prostate gland related to aging and the male hormone dihydrotestosterone.
- Location of the enlargement is more specific to symptoms than the size of the enlargement. Nearer to the urethra, more problems.

Benign Prostatic Hypertrophy

- No known cause other than aging
- No proven method of prevention since there is no known cause
- Researching Saw Palmetto supplement aimed at slowing the enlargement process

Signs and Symptoms

- Decrease in size and force of urinary stream
- Difficulty in starting urinary stream
- Dribbling at the end of urination
- Interrupted stream, starting and stopping of urine
- Urinary retention
- Overflow incontinence

Complications

- Complications related to urinary retention
 - Bladder dysfunction
 - Recurrent UTI's
 - Calculi
 - Hydronephrosis
 - Renal insufficiency
 - Urosepsis

Diagnosis

- History
- Digital rectal examination
- Urinalysis
- BUN and creatinine
- Prostate specific antigen
- Urodynamic flow studies
- Transrectal ultrasound of the prostate
- Cystoscopy

Medical Treatment

- If not exhibiting symptoms or symptoms are mild- no treatment, monitor patient for increase in s/s.
- Drug therapy
 - Meds to relax smooth muscle of prostate and bladder neck (Minipress, Hytrin, and Cardura) Alpha blockers
 - Meds to block the male hormone (Proscar)

Medical Treatment

- Non-surgical options
 - Transurethral microwave antenna (TUMA)
 - Prostatic balloon
 - Prostatic stents

Surgical Procedures

- Transurethral resection of the prostate (TURP)
 - Used the past 50 years to relieve obstruction related to an enlarged prostate
 - Anesthesia
 - Resectoscope
 - Total prostate is not removed (peeled away like the rind of an orange)
 - Remaining prostate will continue to grow and may cause obstruction in the future

Post-op Nursing Interventions

- Standard post-op observations
- Foley catheter in place from OR
 - 30 to 60 ccs of sterile water inflating balloon
 - » Catheter taped to leg or abdomen, balloon overinflated to tamponade (compress) the prostate to stop bleeding
 - » Irrigation solution flows continuously through catheter to maintain catheter patency by removing clots and chips
 - » Monitor output, observe color, presence of clots, monitor vital signs for signs of hemorrhage, I&O

Complications of TURP

- Main complications:
 - Clot formation
 - Bladder spasms
 - Infection
- Less common complications:
 - Urinary incontinence
 - Hemorrhage
 - Erectile dysfunction

Complications of TURP

- Common side effect: retrograde ejaculation

When the prostate is removed there is a decrease in the amount of semen produced and a part of the ejaculatory ducts may be removed. Less semen pushed outside the body. Refluxes into bladder. Harmless- semen voided out with next urination.

Surgical Procedure

- Open prostatectomy
 - Very large prostate
 - Cancerous prostate
- Open prostatectomy approaches
 - Suprapubic approach
 - Incision is made through the lower abdomen into the bladder. The prostate gland removed. The urethra is reattached to the bladder.

Open Prostatectomy

- Retropubic approach
 - Similar to the suprapubic approach, except there is no incision into the bladder.
- Perineal prostatectomy
 - Rarely done due to the increased risk of contamination of the incision due to the close proximity to the rectum, increased risk of urinary incontinence, erectile dysfunction or injury to the rectum.

Open Prostatectomy

- More invasive than other BPH surgeries
 - Longer hospital stay
 - Necessity of suprapubic catheter
 - Abdominal incision
 - Increased risk for complications

Patient Education

- Expectations after surgery
- Patient and family need to be made aware that urine will be blood tinged and contain small clots initially, decrease their anxiety
- Tell patient they may have pain due to bladder spasms and a suppository will be available for relief (B&O supp) Belladonna and opium supp. Patient may correlate suppository with bowel movement.

Nursing Interventions

- Ambulation and other activities should be controlled by the characteristics of the drainage in the catheter bag. If the drainage is bright red or has large clots, the patient should be encouraged to lie down in bed until the color lightens and the clots are diminished.

Increased Risk For Infection

- The risk for catheter induced infections is very high unless sterile technique is used when the catheter is opened for irrigation.
- Discharge instructions: patient needs to be supplied with written and verbal catheter care instructions, need for increased fluids to prevent UTI.
- Patients routinely placed on antibiotics during the operation and occasionally postoperatively to prevent infection.

Discharge Education

- Increase fluids (2500 cc/day) unless contraindicated of water, non citrus fruit juices, cranberry juice, and noncaffeinated, nonalcoholic beverages.
- Limit activities to short periods of sitting or walking followed by rest
- Climb stairs once a day

Discharge Education

- Should not drive or engage in sexual activity until after checkup with surgeon usually 4 to 6 weeks.
- No heavy lifting. Limited to ten pounds or less.

Cancer of the Prostate

- Second most common cause of cancer death in American men older than 60 years of age
- Prostate cancer depends on testosterone to grow. The cancer cells are usually slow growing and begin in the posterior or lateral part of the gland.

Cancer of the Prostate

- Spread by one of three routes:
 - Local invasion- spread into the bladder, seminal vesicles, or peritoneum
 - Spread through the lymph system- to pelvic nodes and can travel as far as the supraclavicular nodes
 - Spread through the vascular system- to the bone, lung, and liver.
- Prostate cancer is staged or graded based on the growth or spread.

Cancer of the Prostate

- Age is the primary risk factor
 - Rarely found in men younger than 40
- Other risk factors
 - Higher levels of testosterone
 - High fat diet
 - Immediate family history
 - Highest in African-American men and lowest in Japanese men
 - Occupational exposure: cadmium (welding, electroplating, and alkaline battery manufacturing)

Signs and Symptoms

- Early Stage A
 - Rare s/s
- Later Stage B and C
 - Urinary obstruction
 - Hematuria
 - Urinary retention
- Advanced Stage D
 - Bone pain (back or hip)
 - anemia

Signs and Symptoms

- Advanced Stage D
 - Weakness
 - Weight loss
 - Overall tiredness

Complications

- Early complications related to bladder problems, such as difficulty in urinating, and bladder or kidney infection.
- As the cancer metastasizes, the patient may develop problems such as pain, bone fractures, weight loss, and depression.

Diagnosis

- Routine DRE (Digital rectal exam)- often a hard lump or hardened lobe is felt.
- PSA (prostate specific antigen) blood test- would show an increased level.
- PAP (prostatic acid phosphatase- an enzyme that normally affects metabolism of prostate cancer cells. Increased number indicates cancer. Normal value is less than 3.

Diagnosis

- Transrectal ultrasound and biopsy- when a palpable tumor is felt.
- Upon diagnosis- bone scans and other tests will be ordered to determine if the cancer has spread outside the prostate gland.

Medical Treatment

- Stage A treated with testosterone suppressing medications
 - Leuprolide (Lupron)
 - Goserelin (Zoladex)
 - Surgery (TURP or open prostatectomy)
 - Combination of medication and radiation therapy

Medical Treatment

- Stage B and C
 - Radical prostatectomy
 - Radiation therapy
 - Implantation of radioactive “seeds” into the prostate (brachytherapy)

Medical Treatment

- Stage D
 - Relief of symptoms
 - Blocking testosterone by bilateral orchiectomy
 - Estrogen therapy
 - Administration of antiandrogen (Eulexin)
 - Testosterone suppressing meds (Zoladex and Lupron)
 - Sometimes chemotherapy to help relieve symptoms from the metastasis

Success of Therapy

- Radioactive seeds, radiation, and radical prostatectomy combinations are showing favorable results in the treatment of advanced cancer.
- Gene therapy, vaccine, and immune-based interventions are the latest medical treatment options under investigation in the war against prostate cancer.
- Nontraditional prostate cancer prevention using vitamin E and selenium is currently being investigated in a 5 year nationwide study.

Radical Prostatectomy

- Radical prostatectomy
 - Cancer of the prostate
 - Gland too large to resect using TURP
- Post-op radical prostatectomy
 - Large indwelling catheter in the urethra and may also have a suprapubic catheter
 - Penrose drain
 - Sterile dressing changes

Complications

- Hemorrhage
- Infection
- Loss of urinary control
- Erectile dysfunction

Patient Education

- All men older than age 40 should have a yearly DRE of the prostate.
- Prevention and early detection are the best ways to fight prostate cancer.

Penile Disorders

- Problems of the penis, aside from sexually transmitted diseases, are fairly rare but may cause great concern and worry for the patient.
- Difficulty seeking help
- Important to be sensitive to patient's feelings.

Peyronie's Disease

- Fibrous bands or plaques form mainly on the dorsal part of the penis
- May be caused by injury or inflammation and may be intermittent
- If the plaque is thick it can cause curvature of the penis, painful erection, difficulty in vaginal penetration and erectile dysfunction

Treatment

- Conservative treatment
 - Vitamin E
 - Steroids
 - Ultrasound
- Surgery to remove plaque
- Peyronie's disease is not life threatening and can be treated.

Priapism

- Painful erection that lasts too long
- Anytime an erection lasts longer than 4 to 6 hours it can become a medical emergency.
- Small veins in the corpora cavernosa spasm, blood cannot drain back out of the penis. When blood does not drain, tissue of the penis does not get oxygen and there can be permanent tissue damage.

Complications

- Complete loss of erection ability after the priapism episode
- Can prevent the patient from passing urine, which can lead to painful bladder and kidney problems.

Priapism

- Causes:
 - Prolonged sexual activity
 - Sickle cell anemia
 - Leukemia
 - Widespread cancer
 - Spinal cord injury or tumors
 - Use of crack cocaine or certain other drugs

Treatment

- Ice packs
- Sedatives
- Analgesics
- Injections of medications directly into the penis to relax the vein spasms
- Needle aspiration
- Irrigation of the corpora
- Last resort: surgery to drain the blood out of the penis

Phimosis and Paraphimosis

Phimosis- a condition in which the foreskin of an uncircumcised male becomes so tight it is difficult or impossible to pull back away from the head of the penis.

Smegma- a cottage-cheese like secretion made by the glands of the foreskin, become trapped under the foreskin and is an excellent place for bacterial and yeast infections.

Treatment

- Antibiotics
- Warm soaks to the area
- May cut a small slit in the foreskin to relieve pressure and treat the infection
- If problem continues full circumcision is recommended

Prevention

- Good hygiene
 - Pull the foreskin back
 - Wash with mild soap and water daily
 - Replace the foreskin to its normal position

Paraphimosis

- Occurs when the uncircumcised foreskin is pulled back during intercourse or bathing and not immediately replaced in a forward position.
- Causes constriction of the dorsal veins, which leads to edema and pain.
- Moderate to severe paraphimosis is a medical emergency and requires immediate care by a physician. The longer the problem continues, the greater the risk of circulation problems and possible gangrene.

Prevention

- Daily cleaning
- Replacing foreskin in its normal position

Cancer of the Penis

- Cancer of the penis has been found in men who were not circumcised as babies or have acquired the human papillomavirus (HPV).
- The tumor looks like a small, round, raised wart.
- It is one form of cancer that may be spread to the sex partner.

Cancer of the Penis

- Several research studies have found a link between cancer of the penis and cancer of the uterine cervix.

Treatment

- Minor surgery
 - Circumcision
 - Laser removal of the growth
- If the cancer has spread, the treatment may mean cutting away part or all of the penis, radiation, or chemotherapy.
- Finding and treating any wartlike tumor in its earliest stages is an important part of patient education.

Testicular Disorders

- Cryptorchidism (undescended testicles)
 - Congenial condition in which one or both of the testes are not in the scrotum
 - Testes normally descend in the last 1 to 2 months before birth
 - Before age 2 testes may descend on their own
 - If they do not descend by age 2, surgery should be done

Complications

- Testes that are not brought down into the scrotum decrease a man's chances of fertility. Usually because excessive body heat damages sperm production in the testes.
- Studies have shown that the chances of testicular cancer are also higher if the condition is not corrected before the child reaches his teens.

Hydrocele

- Collection of fluid in the scrotal sac
 - Not dangerous
 - Generally do not cause pain
- Cause is unknown
 - Can occur at any age
- Treatment is not necessary unless the hydrocele is so large it causes discomfort, embarrassment, or is a threat to the blood supply
- If necessary: aspiration of fluid or fluid is surgically drained

Varicocele

- Condition also referred to as varicose veins of the scrotum
- Main blood supply to the testes travels along the spermatic cord
- Veins become dilated, standing precipitates symptoms: pulling sensation, dull ache, or scrotal pain.
- Sensations are most often felt while standing

Varicocele

- Most varicoceles occur on the left side since the scrotal vein enters at a sharp angle from the left renal vein
- Often undiagnosed until an infertility issue
- Believed that the varicose veins increase the temperature of the testes and cause damage to the sperm
- Most successful treatment is surgical repair of the varicose veins

Epididymitis

- The epididymis is a small tube along the back of the testes where sperm is matured for its last 10 to 12 days before it is ready to be ejaculated.
- Epididymitis is inflammation or infection of the epididymis that may be caused by bacteria, viruses, parasites, chemicals or trauma.

Epididymitis

- May be associated with prostate infections and is usually painful, with the scrotal skin being tender, red, and warm to touch.

Treatment

- Antibiotics
- Partner is also treated if it was sexually transmitted
- Depending on the severity of the pain, may be placed on bedrest with the scrotum elevated, possibly ice pack, and also analgesics.

Complications

- Pain and redness usually subside in about a week, although the swelling may last for several weeks.
- Complications may include
 - Chronic epididymitis
 - Abscess formation
 - sterility

Orchitis

- Rare inflammation or infection of the testes.
- May be caused by trauma or surgical procedures, chemical substances, infection from epididymitis, UTI, influenza, infectious mononucleosis, tuberculosis, gout, pneumonia, or mumps (after puberty)

Orchitis

- Signs and symptoms
 - Swollen, extremely tender testes
 - Red scrotal skin
 - Fever

Orchitis

- Treatment
 - Bedrest
 - Scrotal support
 - Antibiotics
 - Analgesics
 - Fever reducers
- Complications of sterility from mumps orchitis can be prevented by giving boys the mumps vaccine at an early age

Cancer of the Testes

- Most common solid tumor in men 15 to 40 years of age
- Peaks between 20 and 34 years of age
- Etiology is unknown
- Risk factors include:
 - Cryptorchidism (failure of testes to descend)
 - Family history
 - Mother's use of DES (an estrogen preparation once used to prevent spontaneous abortion) during pregnancy

Cancer of the Testes

- Risk factors include:
 - White race
 - High socioeconomic status
- Tumors
 - Mostly a germ cell type of cancer formed during normal embryo development

Prevention

- Monthly testicular self examination
- Procedure should be taught to males 15 to 40 years of age
- All men after puberty should do monthly exams

Signs and symptoms

- Early warning signs
 - Small, painless lump on the side or front of the testes
 - Scrotal swelling
 - Scrotum feels heavy
- Late symptoms
 - Back pain
 - Shortness of breath
 - Difficulty swallowing
 - Breast enlargement
 - Changes in vision or mental status, all indicate metastasis of the cancer

Diagnosis

- After tumor is found
 - Ultrasound of testes
 - If positive for cancer, chest x-ray to look for metastasis
 - Scan of lymph nodes, liver, brain, and bones
 - Blood work for tumor markers
 - » bHCG beta human chorionic gonadotropin is a tumor marker for testicular cancer
 - Exploration
 - Biopsy
 - Removal of testes

Diagnosis

- Staging of testicular tumors
 - Stage I: tumor only in the testes
 - Stage II: tumor spread to groin lymph nodes
 - Stage III: tumor spread past lymph nodes, usually to the lungs

Medical Treatment

- Intervention depends on the stage of the cancer.
- All treatment begins with complete removal of cancerous testes, spermatic cord, and local lymph nodes.
- Stage I tumor treatment: radiation to the groin area lymph nodes

Medical Treatment

- Stage II: chemotherapy.
- Stage III or metastatic: radiation and chemotherapy
- Prognosis is good when cancer is found in the early stages. Complete recovery about 75%.

Patient Education

- Prevention is the key: stress importance of monthly testicular exams
- Cancer diagnosis:
 - Emotional support
 - If will want to have children in the future educate them to sperm bank deposits before orchiectomy
 - Sex therapist
 - Encouragement to deal with side effects of radiation and chemotherapy