The diseases of the urethra and penis

Surgical Anatomy

On average, the female urethra 4 cm from the bladder neck to the vaginal vestibule. Its lining changes gradually from transitional to nonkeratinized stratified squamous epithelium**.** The male urethra is on average 25 cm .The mature male urethra is divided into four segments: (1) the prostatic urethra—from the bladder neck to the proximal margin of the urogenital diaphragm; (2) the membranous urethra—the segment that traverses the urogenital diaphragm (the striated sphincter); (3) the bulbous urethra—the portion from the distal margin of the membranous urethra to the penoscrotal angle; and (4) the penile urethra—that segment which traverses the length of the penile shaft, including the glans.

Congenital anomalies of the urethra and penis

(1) Hypospadias

Hypospadias is an abnormality of anterior urethral development in which the urethral opening is ectopically located on the ventrum of the penis proximal to the tip of the glans penis. The penis is more likely to have associated ventral shortening and curvature, called chordee, with more proximal urethral defects.

The location of the abnormal urethral meatus classifies the hypospadias. most physicians use the classification that was proposed by Barcat and modified by Duckett, which describes the location of the meatus after correction of any associated chordee. Descriptive locations include anterior (glanular and subcoronal), middle (distal penile, midshaft, and proximal penile), and posterior (penoscrotal, scrotal, and perineal). The location is anterior in 50% of cases, middle in 20%, and posterior in 30%, with the subcoronal position being the most common overall.

Hypospadias occurs in approximately 1 in every 250 male births in the United States. The incidence of hypospadias is greater in whites than in blacks, and it is more common in those of Jewish and Italian

Morbidity: Hypospadias is generally repaired for functional and cosmetic reasons. The more proximally ectopic the position of the urethral meatus, the more likely the urinary stream is to be deflected downward. Any element of chordee can exacerbate this abnormality. Fertility may be affected.

Examination: A dorsal hood of foreskin and glanular groove are evident, but upon closer inspection, the prepuce is incomplete ventrally and the urethral meatus is noted in a proximally ectopic position. Rarely, the foreskin may be complete, and the hypospadias is revealed at the time of circumcision.

Chordee may be readily apparent or only during erection. Posterior hypospadias is commonly associated with a bifid scrotum and penoscrotal transposition, in which the rugated scrotal skin begins lateral to the penis, instead of its normal posterior origin.

Undescended testes and inguinal hernias are the most common anomalies associated with hypospadias; look for undescended testes and inguinal hernias during the review of symptoms and physical examination.

Causes: Several etiologies for hypospadias have been suggested, including genetic, endocrine, and environmental factors.

Surgical correction: The goals of treating hypospadias are to create a straight penis by repairing any chordee, to create a urethra with its meatus at the tip of the penis (urethroplasty), to reform the glans into a more natural conical configuration (glanuloplasty), to achieve cosmetically acceptable penile skin coverage, and to create a normal appearing scrotum. The resulting penis should be suitable for future sexual intercourse, and should present an acceptable cosmetic appearance.
Timing of surgery: most physicians attempt to repair hypospadias when the child is aged 6-18 months, but better before school age. This has been associated with an improved emotional and psychologic result.
Adjuvant hormonal therapy: Presurgical treatment with testosterone injections or creams, as well as human chorionic gonadotropin (HCG) injections, has been used to promote penile growth, and some have reported improvement in chordee with lessening in the severity of the hypospadias.

Complications of surgical treatment:

- Immediate: Local edema, Postoperative bleeding and Infection.
- Long-term: Urethrocutaneous Fistula, Meatal stenosis, Stricture, Diverticula and Hair in the urethra

(2) Epispadias

Distal groove usually extends from the meatus through the splayed glans. The penopubic type has the urethral opening at the penopubic junction, and the entire penis has a distal dorsal groove extending through the glans.
Females with epispadias have a bifid clitoris and separation of the labia.

(3) Meatal stenosis

Newborns are often suspected of having meatal stenosis of some degree. This condition is thought to be secondary to ammonia dermatitis following circumcision and resulting in prolonged irritative meatitis.
Calibration is important, since the visual appearance of the meatus does not correlate well with its actual size. The urethra should easily accept the tip of an 8F pediatric feeding tube. Treatment either dilatation &/or meatotomy (meatoplasy)
A meatal caliber less than 5F in children under 10 years of age is an indication for surgery.

(4) Posterior Urethral Valve (PUV)

PUV is a congenital obstruction caused by a malformation of the posterior urethra. The significance of this obstruction is dependent on the secondary effects on the bladder, ureters, and kidneys.
During embryogenesis, the most caudal end of the mesonephric duct is absorbed into the primitive cloaca at the site of the future verumontanum in the posterior urethra. In healthy males, the remnants of this process are the posterior urethral folds called plicae colliculi. Abnormally high insertion and fusion of these primitive folds are believed to be the origin of 95% of PUVs.

Frequency: In the USA, PUV is the most common cause of lower urinary tract obstruction in male neonates; reported incidence is 1 per 8,000 -- 25,000 live births.PUV occurs exclusively in males. The homolog to the male verumontanum from which the valves originate is the female hymen. Approximately 10-15% of children undergoing renal transplant have PUV as the cause of renal insufficiency, and approximately one third of patients born with PUV progress to ESRD.

Clinical Presentation

Children with congenital posterior urethral obstruction present in a variety of ways, depending primarily on the degree of obstruction. Classically, presenting symptoms are age dependent.

In the newborn, palpable abdominal masses (distended bladder, hydronephrosis), ascites, or respiratory distress from pulmonary hypoplasia suggests the possibility of severe bladder outlet obstruction

Patients presenting during the toddler years are likely to have somewhat better renal function and usually present because of urinary infection or voiding dysfunction. School-age boys—the least common age for presentation—more often have voiding dysfunction, which is usually manifested as urinary incontinence, as their primary complaint. Not all children presenting late do well, however. In one series, 35% of patients who presented at more than 5 years of age had renal insufficiency, and 10% ultimately developed end-stage renal failure

Imaging Studies:

- Renal and bladder sonography. Prenatally the characteristic findings in a fetus with posterior urethral valves are bilateral hydronephrosis, a distended and thickened bladder, a dilated prostatic urethra (seen occasionally), and varying degrees of amniotic fluid abnormality (oligohydromenous).
- Voiding cystourethrography (VCU)
  - Perform VCUG during voiding and under fluoroscopy, with imaging of the posterior urethra.
  - The diagnosis of PUV is indicated by visualization of the valve leaflets. Other clues to the diagnosis are a thickened trabeculated bladder, a dilated or elongated posterior urethra, and a hypertrophied bladder neck. Diverticula, cellules, vesicoureteral reflux, and reflux into the ejaculatory ducts secondary to elevated bladder and urethral pressures also may be present.

Other Tests:

- Urodynamic studies
- Cystoscopy serves both diagnostic and therapeutic functions in these infants. Appropriately infant-sized cystoscopes (<8F) are needed to avoid injury to the urethra

Management

Management of posterior urethral valves depends on the degree of renal insufficiency as well as the age of the child.

The placement of a urethral catheter and initiation of prophylactic antibiotic management allow for assessment of the baseline level of renal function during the first few days after birth.

Older children who present with voiding dysfunction or urinary tract infection but satisfactory renal function are easily and effectively treated initially by endoscopic destruction of the urethral valve alone.

In the unusual situation in which the newborn urethra seems too small to accommodate the available endoscopes, an elective vesicostomy is appropriate and safe.

URETHRITIS

Inflamation of the urethra. It can be caused by bacrerial, viral, chemical or other agents

It is classified in to either Gonococcal or Nongonococcal Urethritis.

Gonococcal Urethritis (GU) is associated with the gram-negative diplococcus, N. gonorrhoeae. The incubation period for GU varies from 3 to 10 days, but exceptions are very common. For example, some strains of gonococci produce symptoms in a period as short as 12 hours, other strains may take as long as 3 months to manifest themselves.

Non Gonococcal Urethritis(NGU): The most important and potentially dangerous pathogen involved in NGU is C. trachomatis, Mycoplasma, ureaplasma urealyticum, Trichomonas vaginalis,

The usual incubation period for NGU is 1 to 5 weeks, but longer incubation periods often occur

Diagnosis

Classically, GU produces urethral discharge and burning on urination. The discharge is usually profuse and purulent, but it may be scant or even absent. GU may be asymptomatic in 40% to 60% of the contacts of partners with known gonorrhea.

The diagnosis is primarily done by 4 tube test (VB1, VB2, EPS,and VB3) each one send for smear and culture and sensitivity .

Diagnosis of NGU requires demonstration of urethritis and exclusion of infection with N. gonorrhoeae.

Urethral specimens must be obtained from within the urethra and not simply from a drop of discharge (at least 1 hour (preferably 4 hours) after the patient has urinated)

When urethritis is suspected but urethral inflammation cannot be detected, the patient should be examined in the early morning before voiding.

Treatment

Ceftriaxone is currently the recommended drug of choice for the treatment of all uncomplicated gonococcal infections of the pharynx, anorectum, cervix, and urethra

However, the current recommended treatment for GU includes a tetracycline derivative, azithromycin or ofloxacin, because about 30% of men with GU also will be infected with C. trachomatis, which is not sensitive to ceftriaxone.

For NGU Azithromycin 1 g orally in a single dose or doxycycline 100 mg orally two times a day for 7 days is the treatment of choice

Recurrent URETHRITIS: may be due to

1) Reinfection with the initial organism (usually from re-exposure to the same sexual partner who has not been treated)
2) Persistence of the original organism owing to antibiotic resistance