Common Penile Problems

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KEYWORDS

• Hypospadias • Chordee • Priapism • Phimosis
• Paraphimosis • Peyronie disease

Patients from infancy to adulthood can present with a variety of penile problems, ranging from congenital to acquired conditions. This article reviews some of the more common conditions that are encountered in a typical primary care office practice. Although surgical procedures are discussed, the emphasis is on diagnosis, evaluation, and a general discussion of treatment options.

PENILE ANATOMY AND EMBRYOLOGY; A BRIEF REVIEW

Terminology and Pertinent Embryology

The penis is not a single solid structure. Unlike other parts of the human body that extend outward from the trunk, there is no central bone or cartilage around which are layered muscles, fat, and skin. Instead, the penis is composed of 3 major deep structures wrapped by skin: 2 corpora cavernosa bodies and a single corpus spongiosum. All 3 bodies contain erectile tissue that can become distended with blood. Surrounding this entire package of erectile bodies is Buck fascia. In normal situations, there is free flow of blood between the corpora cavernosa, so they function as a single unit. The corpora cavernosa are responsible for the primary structural integrity of erection. When engorged with blood, they inflate and become rigid. This rigidity is maintained by the tunica albuginea, a tough sheath of tissue that envelopes the corpora cavernosa. The 2 corpora cavernosa share a common wall formed by the tunica albuginea from each side. The posterior quarter of each corpus as it nears the pubic symphysis becomes the crura, a tough tendonlike tissue that acts as the anchoring point of the penis to the ischiopubic rami. The corpus spongiosum surrounds the

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urethra and distally enlarges to form the head of the penis, also known as the glans penis. Proximally, the corpus spongiosum forms the bulbous urethra.

Embryologically, during the third week of development, the mesenchyme from the primitive streak migrates around the cloacal membrane to form a pair of cloacal folds. At the cranial end, the folds fuse and unite to form the genital tubercle. At the caudal end, the cloacal folds subdivide into the urethral folds anteriorly and the anal folds posteriorly. At the same time, the genital swellings form on either side of the urethral folds. They will become the scrotum in boys and the labia majora in girls. After the sixth week, the fetal testes secrete androgens that begin differentiating the external genitalia, causing elongation of the pubic tubercle, which becomes the phallus. During this elongation, the phallus pulls the urethral folds forward to form the lateral walls of the urethral groove. This groove runs from the caudal end but does not completely reach the distal end at the glans. The lining of the groove is epithelial and originates from the endoderm. It becomes the urethral plate. By the end of the third month, the urethral folds close over the urethral plate, forming the penile urethra. This fusion occurs along the ventral midline of the phallus, but the newly created tube does not yet reach the tip of the phallus. Around the fourth month, the distal portion of the urethra is formed when ectodermal cells from the tip of the glans invaginate and form a short epithelial cord. This cord gradually thins and develops a lumen, forming the urethral meatus. The invaginating lumen from this cord meets the lumen of the penile urethra, establishing a continuous urethra (**Fig. 1**). The early developments set up the later ones, so, when an anomaly occurs, it usually results in a constellation of findings.

Natural History of Physiologic Phimosis

At birth, there is normally a physiologic phimosis, a natural inability to retract the foreskin (or prepuce) because of natural adhesions between the glans and the prepuce. During the first 3 to 5 years of life, as the penis develops, epithelial cells and natural oil accumulate to form smegma, which displaces the prepuce from the glans. Intermittent erections also distend the foreskin. The combination of these 2 factors ultimately allows the prepuce to be completely retractable. By age 3 years, most boys can retract their foreskins, and between the age of 5 and 7 years, nearly 90% can retract their foreskins. By 17 years of age, less than 1% have a persistent phimosis.[1]

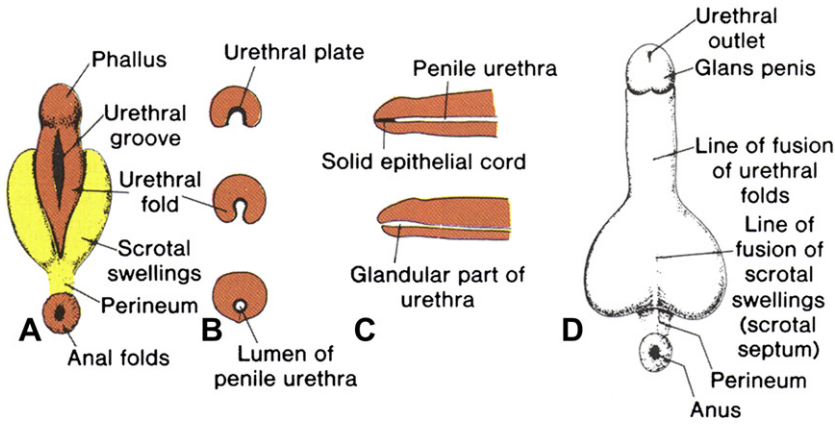

Fig. 1. Development of the external genitalia in males. (*A*) External genitalia at approximately 10 weeks. (*B*) Transverse sections through the phallus during penile urethra formation. (*C*) Development of the glanular urethra. (*D*) Normal newborn (prepuce not shown).