



Figure 21-20 **A**, Normal testis shows tubules with active spermatogenesis. **B**, Testicular atrophy in cryptorchidism. The tubules show Sertoli cells but no spermatogenesis. There is thickening of basement membranes and an apparent increase in interstitial Leydig cells.

progressive tubular atrophy, the cryptorchid testis is small in size and is firm in consistency as a result of fibrotic changes. Similar histologic changes may also be seen in the contralateral (descended) testis in males with unilateral cryptorchidism, suggesting that cryptorchidism is a marker of some intrinsic defect in testicular development or function.

- Bilateral or, in some cases, even unilateral cryptorchidism is associated with tubular atrophy and sterility.
- The cryptorchid testis carries a 3- to 5-fold higher risk for testicular cancer, which arises from foci of intratubular germ cell neoplasia within the atrophic tubules. Orchiopexy reduces the risk of sterility and cancer.

Cryptorchidism is completely asymptomatic, and comes to attention when the scrotal sac is discovered to be empty by the patient or an examining physician. In addition to sterility, cryptorchidism may be associated with other morbidity. When the testis lies in the inguinal canal, it is particularly prone to trauma and crushing injuries. A concomitant inguinal hernia accompanies the undescended testis in about 10% to 20% of cases. In addition, the undescended testis is at a greater risk of developing testicular cancer than is the descended testis.

During the first year of life the majority of inguinal cryptorchid testes descend spontaneously into the scrotum. Those that remain undescended require surgical correction, preferably before histologic deterioration sets in at around 2 years of age. Orchiopexy (placement in the scrotal sac) does not guarantee fertility; deficient spermatogenesis has been reported in 10% to 60% of patients in whom surgical repositioning was performed. To what extent the risk of cancer is reduced after orchiopexy is also unclear, and the risk is changing over time as orchiopexy has been offered at an increasingly younger age over the past few decades (current recommendations are for correction at 6 to 12 months of age). Cancer may also develop in the contralateral, normally descended testis, further supporting the idea that cryptorchidism signals the presence of a defect in testicular development and cellular differentiation that is unrelated to anatomic position.

KEY CONCEPTS

Cryptorchidism

- Cryptorchidism refers to incomplete descent of the testis from the abdomen to the scrotum and is present in about 1% of 1-year-old male infants.

Regressive Changes

Atrophy and Decreased Fertility

Testicular atrophy may be caused by one of several conditions, including (1) progressive atherosclerotic narrowing of the blood supply in old age, (2) the end stage of an inflammatory orchitis, (3) cryptorchidism, (4) hypopituitarism, (5) generalized malnutrition or cachexia, (6) irradiation, (7) prolonged administration of antiandrogens (treatment for advanced carcinoma of the prostate), and (8) exhaustion atrophy, which may follow persistent stimulation by high levels of follicle-stimulating pituitary hormone. The gross and microscopic alterations follow the pattern already described for cryptorchidism. Atrophy occasionally occurs as a primary failure of genetic origin, such as in Klinefelter syndrome (Chapter 5).

Inflammation

Inflammations are distinctly more common in the epididymis than in the testis. Of the three major specific inflammatory states that affect the testis and epididymis, gonorrhea and tuberculosis almost invariably arise in the epididymis, whereas syphilis affects the testis first.

Nonspecific Epididymitis and Orchitis

Epididymitis and possible subsequent orchitis are commonly related to infections in the urinary tract (cystitis, urethritis, prostatitis), which reach the epididymis and the testis through either the vas deferens or the lymphatics of the spermatic cord. The cause of epididymitis varies with the age of the patient. Though uncommon in children, epididymitis in childhood is usually associated with a congenital genitourinary abnormality and infection with