



**Figure 21-21** Acute epididymitis caused by gonococcal infection. The epididymis is replaced by an abscess. Normal testis is seen on the right.

gram-negative rods. In sexually active men younger than age 35 years, the sexually transmitted pathogens *C. trachomatis* and *Neisseria gonorrhoeae* are the most frequent culprits. In men older than age 35 the common urinary tract pathogens, such as *E. coli* and *Pseudomonas*, are responsible for most infections.

### MORPHOLOGY

The bacterial invasion induces nonspecific acute inflammation characterized by congestion, edema, and infiltration by neutrophils, macrophages, and lymphocytes. Although the infection, in the early stage, is more or less limited to the interstitial connective tissue, it rapidly extends to involve the tubules and may progress to abscess formation or complete suppurative necrosis of the entire epididymis (Fig. 21-21). Usually, having involved the epididymis, the infection extends into the testis to evoke a similar inflammatory reaction. Such inflammatory involvement of the epididymis and testis is often followed by fibrous scarring, which in many cases leads to sterility. Usually the Leydig cells are not totally destroyed, and as a result androgen production by the testis may be relatively unaffected.

### Granulomatous (Autoimmune) Orchitis

Idiopathic granulomatous orchitis presents in middle age as a moderately tender testicular mass of sudden onset sometimes associated with fever. It may appear insidiously, however, as a painless testicular mass mimicking a testicular tumor, hence its importance. Histologically the orchitis is distinguished by granulomas restricted to spermatic tubules. The lesions closely resemble tubercles but differ in that the granulomatous reaction is present diffusely throughout the testis and is confined to the seminiferous tubules. Although an autoimmune basis is suspected, the cause of these lesions remains unknown.

### Specific Inflammations

#### Gonorrhea

Extension of infection from the posterior urethra to the prostate, seminal vesicles, and then to the epididymis is the usual course of a neglected gonococcal infection. In severe

cases epididymal abscesses may develop, leading to extensive destruction and scarring. The infection may also spread to the testis and produce suppurative orchitis.

#### Mumps

Mumps is a systemic viral disease that most commonly affects school-aged children. Testicular involvement is extremely uncommon in this age group. In postpubertal males, however, orchitis occurs in 20% to 30% of cases. Most often, an acute interstitial orchitis develops about 1 week after the onset of swelling of the parotid glands.

#### Tuberculosis

When it involves the male genital tract, tuberculosis almost invariably begins in the epididymis, from where it may spread to the testis. The infection invokes the classic morphologic reactions of caseating granulomatous inflammation characteristic of tuberculosis elsewhere.

#### Syphilis

The testis and epididymis may be affected in both acquired and congenital syphilis, but almost invariably the testis is involved first, and in many cases the epididymis is spared altogether. The morphologic pattern of the reaction takes two forms: (1) the production of gummas or (2) a diffuse interstitial inflammation that produces the histologic hallmark of syphilitic infections, obliterative endarteritis associated with perivascular cuffs of lymphocytes and plasma cells.

### Vascular Disorders

#### Torsion

Twisting of the spermatic cord typically cuts off the venous drainage of the testis. If untreated, it frequently leads to testicular infarction and thus represents one of the few true urologic emergencies. The thick-walled arteries remain patent, producing intense vascular engorgement followed by hemorrhagic infarction.

There are two settings in which testicular torsion occurs. Neonatal torsion occurs either in utero or shortly after birth. It lacks any associated anatomic defect to account for its occurrence. "Adult" torsion is typically seen in adolescence and presents with the sudden onset of testicular pain. It often occurs without any inciting injury and may even occur during sleep. If the testis is manually untwisted within approximately 6 hours of the onset of torsion, there is a good chance that the testis will remain viable. In contrast to neonatal torsion, adult torsion results from a bilateral anatomic defect that leads to increased mobility of the testes (*bell-clapper abnormality*). To prevent the catastrophic recurrence of torsion in the contralateral testis, the testis unaffected by torsion is surgically fixed to the scrotum (*orchiopexy*).

### MORPHOLOGY

Depending on the duration of the process, the morphologic changes range from intense congestion to widespread hemorrhage to testicular infarction (Fig. 21-22). In advanced stages the testis is markedly enlarged and consists entirely of soft, necrotic, hemorrhagic tissue.