



GENITOURINARY SYSTEM

SUBJECT :

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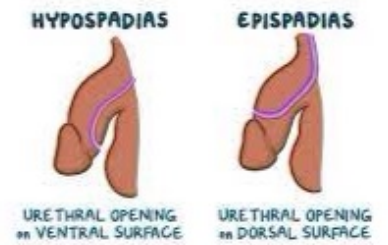
DONE BY :

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Penis

Malformations

The most common penile malformations involve the **abnormal location of the distal urethral opening**, known as **hypospadias** when on the **ventral side** and **epispadias** when on the **dorsal side**. This abnormality can lead to urinary tract issues due to possible constriction of the orifice, increasing the risk of urinary tract infections. Hypospadias affects 1 in 300 live male births and may coincide with other congenital anomalies like **inguinal hernia and undescended testis**. Epispadias is commonly associated with the congenital malformation of the bladder called **extrophy**.



Inflammation lesions

Inflammation of the glans penis, known as **balanitis**, and inflammation of the overlying prepuce, called **balanoposthitis**, are often caused by infection. Common agents include *Candida albicans*, anaerobic bacteria like *Gardnerella*, and pyogenic bacteria. These conditions frequently **arise due to poor hygiene in uncircumcised males**, leading to the accumulation of **desquamated epithelial cells, sweat, and debris** known as **smegma**, which can irritate and infect the area. **Grossly**, the distal penis is typically inflamed, red, swollen, & tender & a purulent discharge may be present.



Phimosis is the inability to retract the prepuce over the glans penis, typically due to scarring from balanoposthitis or as a congenital anomaly.



Neoplasm

Penile tumors, with over 95% being squamous cell carcinomas (SCC), are rare in the US, accounting for about 0.4% of all male cancers. However, in developing countries, SCC occurs at much higher rates. **Most cases occur in uncircumcised patients older than 40 years, with factors such as poor hygiene, smoking, and HPV infection, particularly types 16 and 18, implicated in its pathogenesis.**

SCC of the penis typically arises from malignant cells confined to the epidermis, known as intraepithelial neoplasia or carcinoma in situ. Three clinical variants associated with HPV infection occur on the penis:

1. **Bowen disease**, appearing as a **solitary plaque-like lesion** on the penis shaft in older uncircumcised males, **progresses to invasive SCC in 33% of cases**

2. **Erythroplasia of Queyrat**, characterized by Bowen disease presenting as an **erythematous patch** on the glans penis.

3. **Bowenoid papulosis**, occurring in **young, sexually active males**, presents with multiple **reddish-brown papules on the glans**. It is histologically identical to disease but often transient, with rare progression to carcinoma in immunocompetent patients.



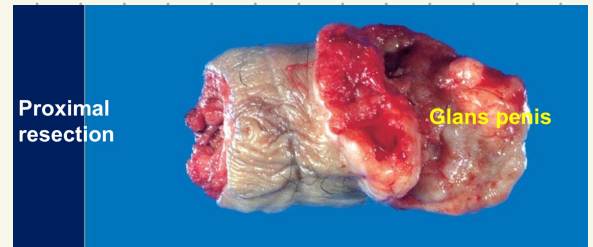
shows hyperchromatic, dysplastic, dyskeratotic epithelial cells with scattered mitoses above the basal layer



Fig. 13.39 Erythroplasia of Queyrat.

Penile squamous cell carcinoma

typically appears as a **gray, crusted lesion on the glans penis** or prepuce, often **infiltrating surrounding tissue**. **Histologically**, it's usually an **infiltrating keratinizing SCC**. **Verrucous carcinoma** is a variant characterized by **papillary architecture**. While **regional lymph node metastases are present in 25% of cases**, distant metastases are rare, with a 70% 5-year survival rate. Advanced cases may deform the glans penis with firm, ulcerated growth.



Scrotum

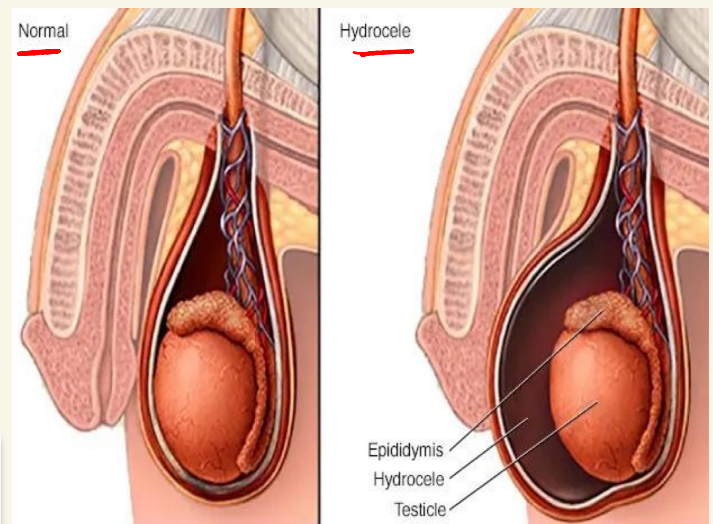
The scrotum is the protective sac holding the testicles outside the body to maintain a cooler temperature for sperm production. Each testicle produces hormones like testosterone, regulated by brain structures. The epididymis, located on top of each testicle, stores and matures sperm. The spermatic cord connects the testicles to the reproductive system, containing blood vessels and nerves. The cremaster muscle, part of the spermatic cord, adjusts the position and temperature of the testicles.

Hydrocele

The most common cause of scrotal enlargement is a hydrocele, which is the **accumulation of serous fluid within the tunica vaginalis**. This can be **idiopathic** or **result from neighboring infections or tumors**. Transillumination can help differentiate a hydrocele from a true testicular mass, as a **hydrocele will transilluminate** while a testicular mass will be opaque.

Less common causes of scrotal enlargement include the **accumulation of blood (hematocele)** or **lymphatic fluid (chylocele)** within the tunica vaginalis, as well as an abnormal accumulation of serous fluid in the sac of the tunica vaginalis.

Hydroceles are typically **remnant of the embryologic processus vaginalis** and may occur in association with **various inflammatory and neoplastic conditions**. While most hydroceles are not large, some can reach considerable size.

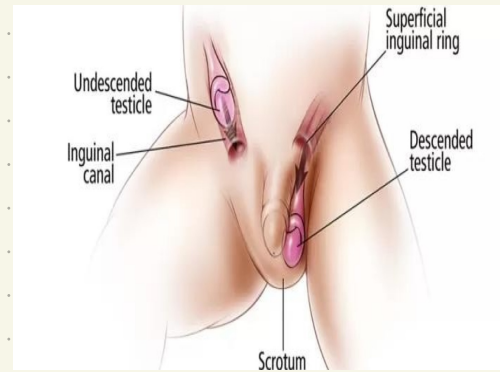


TESTIS & EPIDIDYMIS

Testicular diseases can be congenital, inflammatory, or neoplastic and may cause infertility, atrophy, enlargement, or local pain. Examples include cryptorchidism and testicular atrophy.

Cryptorchidism

Cryptorchidism is the **failure of testicular descent into the scrotum**, typically **diagnosed after one year of age**. It affects about 1% of males by age one, with around 10% of cases being bilateral. **The cause is often unknown**, although **hormonal abnormalities or mechanical issues** may play a role in some cases.



Effects of cryptorchidism include:

1. **Bilateral** cryptorchidism can lead to **sterility**.
2. **Unilateral** cryptorchidism may result in **atrophy of the contralateral** descended gonad and can also lead to sterility.
3. Cryptorchidism is associated with a 3-to 5-fold increase in the **risk of testicular cancer**.

Unilateral cryptorchidism **increases the risk of cancer in the contralateral** descended testis. **Surgical placement** of the undescended testis into the scrotum (**orchiopexy**) **before puberty** can **reduce the risk of atrophy and cancer**, though not eliminate it.

Morphology

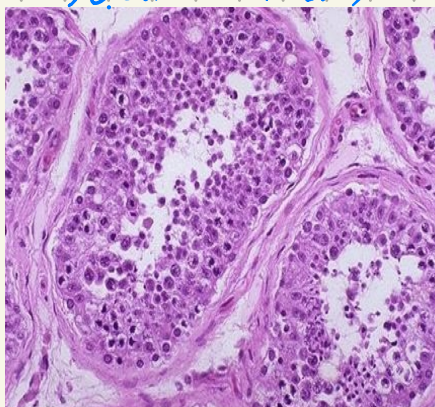
Cryptorchidism is slightly **more common in the right** testis than the left.

Bilateral cases account for **10% of occurrences**. While the cryptorchid testis may be normal in size early in life, some degree of atrophy typically develops by puberty.

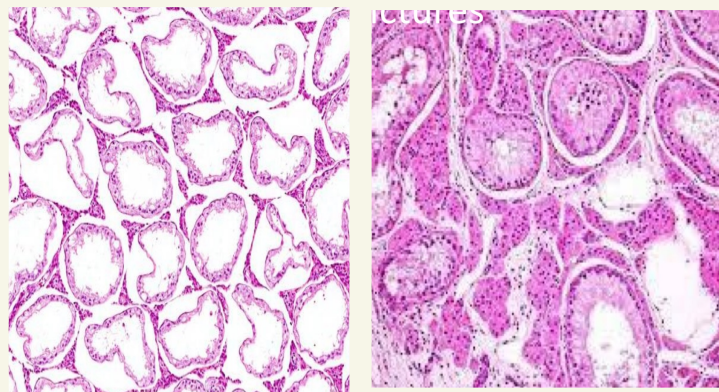
Histology

Cryptorchid testes show evidence of **tubular atrophy by 5 to 6 years of age**, with **hyalinization** present by puberty. **Leydig cell hyperplasia** accompanies this process. Foci of **intratubular germ cell neoplasia** may be present in cryptorchid testes, potentially leading to subsequent testicular cancers.

Normal testis



atrophic testis



Similar tubular atrophy can be caused by various other conditions, including:

- Chronic ischemia
- Trauma
- Chronic hyperestrogenism (e.g., cirrhosis)
- Radiation
- Anti-neoplastic chemotherapy

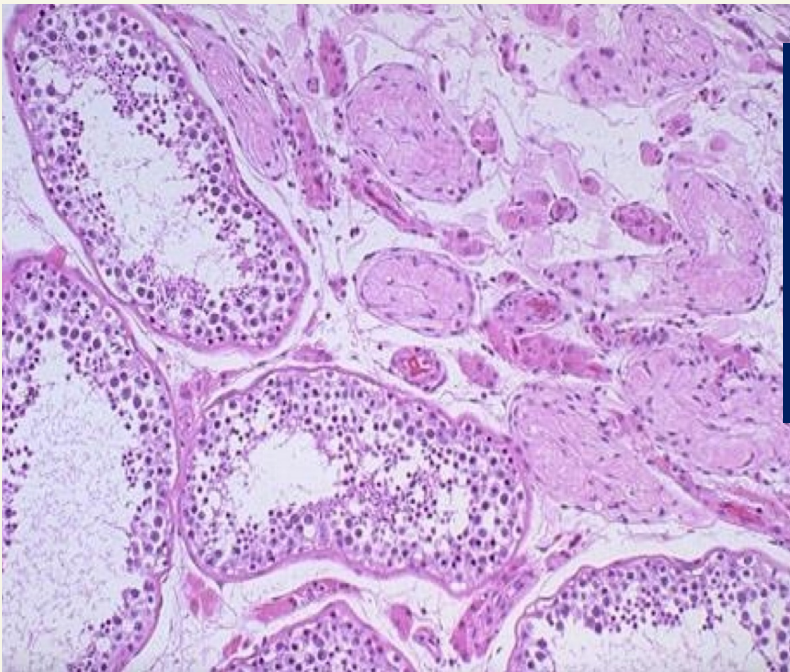
Inflammatory lesions

Inflammatory lesions of the testis are more common in the epididymis than in the testis proper. Some of these are associated with STDs (venereal diseases), while other causes include nonspecific epididymitis, orchitis, mumps, and tuberculosis.

1. Nonspecific epididymitis and orchitis typically start as a **primary urinary tract infection** with **secondary ascending infection to the testis through the vas deferens** or lymphatics of the spermatic cord. The **affected testis is often swollen, tender, and contains a predominantly neutrophilic cell infiltrate.**

2. Orchitis complicates mumps infection in about 20% of infected adult males but is rare in children. The affected testis is **edematous, congested, and contains a predominantly lymphoplasmacytic cell infiltrate.** Some cases may lead to atrophy, fibrosis, and sterility

3. Granulomatous inflammation of the testis may be caused by **infections and autoimmune diseases**, with **tuberculosis** being the most common. Testicular tuberculosis typically begins in the **epididymis, with secondary involvement of the testis.** Histologically, there is **caseous granulomatous inflammation.**



There is **focal atrophy** of tubules seen here to the upper right.

The most common reason for this is probably childhood infection with the mumps virus, which produces a patchy orchitis.

However, it is unusual for this infection to cause enough atrophy to significantly affect the sperm count.

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