



# GENITOURINARY SYSTEM

SUBJECT : Male genital tract

LEC NO. : 8

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# GENITOURINARY SYSTEM

## The Male Genital System

In the following lectures, we will consider the most common malformations, inflammatory conditions, & neoplasms involving the penis & scrotum, prostate, & testes

### ❑ PENIS: Malformations

- The most common malformations are abnormalities in the location of the urethral orifice:

❖ **Hypospadiasis** (HYP) is abnormal opening of the distal urethra orifice anywhere along the ventral aspect of the shaft of the penis. The orifice may be **constricted**, resulting in **obstruction** with an increased risk of **UTI**.

❖ **Epispadias** indicates the presence of the urethral orifice on the dorsal aspect of the penis, may produce obstruction or result in urinary incontinence. It is commonly associated with the congenital malformation of the bladder called **extrophy**.

## Hypospadiasis

هو اضطراب خلقي يتميز بانحراف فتحة البول اسفل مكانها الطبيعي و هاد طبعا رح يادي لصعوبه في التبول و يؤدي لإلتهاب بالمسالك البولييه الخ علاجها عادة



## Epispadias

هو اضطراب خلقي ايضا يتميز بانحراف فتحة البول الى الأعلى بدلاً من الامام و بتكون عادة مصاحبة لل bladder extrophy



**BLADDER EXSTROPHY**  
\* CONGENITAL MALFORMATION  
\* BLADDER PROTRUDES OUTSIDE ABDOMEN due to ABDOMINAL WALL DEFECT

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## Penis Inflammatory Lesions are

- (I) mostly caused by **Sexually Transmitted Diseases**,
- (II) **local inflammatory processes unrelated to STDs**, &
- (III) several other **systemic inflammatory diseases** may, on occasion, produce penile lesions.

### Local inflammation of the

(1) Glans penis is called **Balanitis**

2) glans penis + the overlying prepuce is called **balanoposthitis**.

Most cases occur as a consequence of poor local hygiene **in uncircumcised males**.

Grossly , the distal penis is typically **inflamed, red, swollen, & tender; & a purulent discharge may be**

قد تؤدي بالنهاية الى  
عقم او كانسر

### Balanopthitis

Pus

the inflammation of the foreskin and glans in uncircumcised males, balanoposthitis occurs over a wide age range and may have any of multiple bacterial or fungal origins or be caused by contact dermatitides



Whitish material due to  
fungal infection or contact  
dermatitis

**Balanitis and balanoposthitis are local inflammation of glans penis As a result of poor hygiene**

بس الفرق انه ال **balanitis** يقتصر فقط على **glans penis** / اما ال

**balanoposthitis** فهو التهاب بال **glans penis** و **foreskin**

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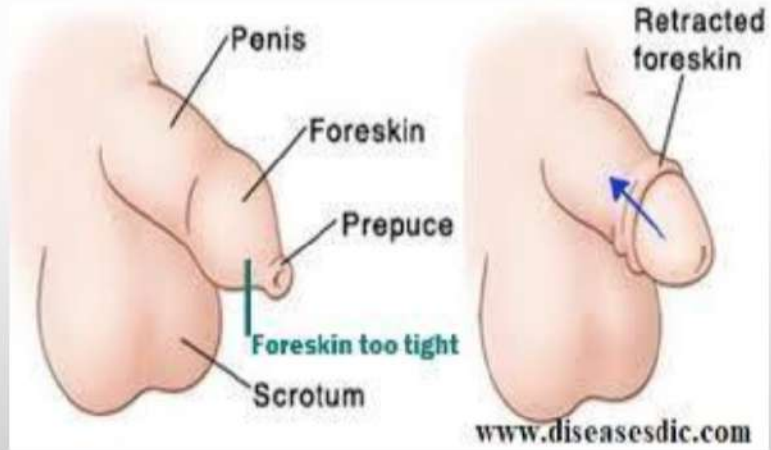
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## Phimosis

### Foreskin

- a condition in which the prepuce cannot be retracted easily over the glans penis.

Some cases are **congenital anomaly**, but most cases are **acquired** from scarring of the prepuce secondary to previous episodes of balanoposthitis.



من اسباب الحالة هاي هو **poor hygiene** مما يؤدي الى تراكم البكتيريا تحت ال **foreskin**. و هاد الاشئ بعمل تضيق في ال **foreskin** ، و كمان ممكن يكون السبب **Skin infections or bacterial infections cause swelling of the foreskin and scarring** او **uncircumcised** طفل

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### Neoplasms of the penis

- More than **95% of penile tumors are squamous cell carcinomas (SCC)**, uncommon in the US, accounting for about 0.4% of all cancers in males. In developing countries, however, penile SCCa occurs at much higher rates. → **skin** لأنه
  - Most cases occur in:**
    - (1) uncircumcised **Patients** older than 40 years of age.
- Several factors have been implicated in the pathogenesis of the penis SCC**, including:
- (2) poor hygiene (with resultant exposure to potential carcinogens in smegma),
  - (3) smoking, &
  - (4) **infection with HPV**, particularly types 16 & 18.



اكتر من 95% من حالات penile cancer are SCC و  
هي غالبا تصيب Uncircumcised middle aged  
men او ممكن صار في عدوى ب HPV type 16 or 18 و  
هدول الانواع مثل ما اخدنا قبل انهم cancerous types

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- SCC of the penis (as with other body sites) is generally preceded by the appearance of malignant cells confined to the epidermis, termed intraepithelial neoplasia or carcinoma in situ.

Three clinical variants of carcinoma in situ, **all strongly associated with HPV infection**, occur on the penis:

1) **Bowen disease** (which may also occur elsewhere on the skin & mucosal surfaces, including the vulva & oral mucosa) occurs in **older uncircumcised males** & appears grossly as a **solitary, plaque like lesion on the penis shaft.**



Bowen's disease, also known as squamous cell carcinoma in **situ**, is a type of precancerous lesion that affects any part of the skin. It typically appears as a slow-growing, red or pink, scaly patch that may resemble eczema or psoriasis, if this disease affect the glans penis it's called (**erythroplasia of queyrat**). However, if left untreated, it can progress to invasive squamous cell carcinoma.



Fig. 13.39 Erythroplasia of Queyrat.

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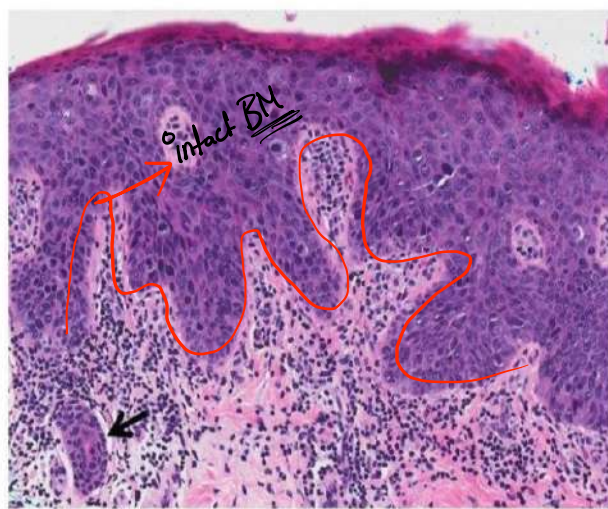
❑ Histopathology: there are malignant cells throughout the epidermis with no invasion of the underlying stroma (in situ ca).

❑ Bowen disease involving the penis progresses to **invasive SCC** in **33%** of cases. تلت الحالات

(II) When Bowen disease presents as an erythematous patch on the **glans penis**, it is called **Erythroplasia** of Queyrat.

Bowen disease (Ca in situ) penis.

The epithelium above the intact basement membrane (which is not seen in this picture) shows hyperchromatic, dysplastic, dyskeratotic epithelial cells with scattered mitoses above the basal layer



Whole thickness involved by malignant cells and the BM is intact

(III) **Bowenoid papulosis** occurs in young, sexually active males & is **identical to Bowen disease histologically**, but clinically it presents with multiple reddish brown papules on the glans & is most often transient, with only rare progression to carcinoma in immunocompetent patients.

CARCINOMA IN SITU  
A. ERYTHROPLASIA OF QUEYART:  
GLANS OF PENIS, RED VELVETY  
PLAQUE

B. BOWENOID PAPULOSIS : MULTIPLE,  
USUALLY NOT INVASIVE, USUALLY  
AFFECTS YOUNGER PATIENTS

C. BOWEN'S DZ : SHAFT, SCROTUM,  
PROGRESSES TO SCC ... GREY  
SOLITARY CRUSTY PLAQUE,  
USUALLY AFFECTS MEN IN THEIR 5TH

DECADE

← الشبهوا

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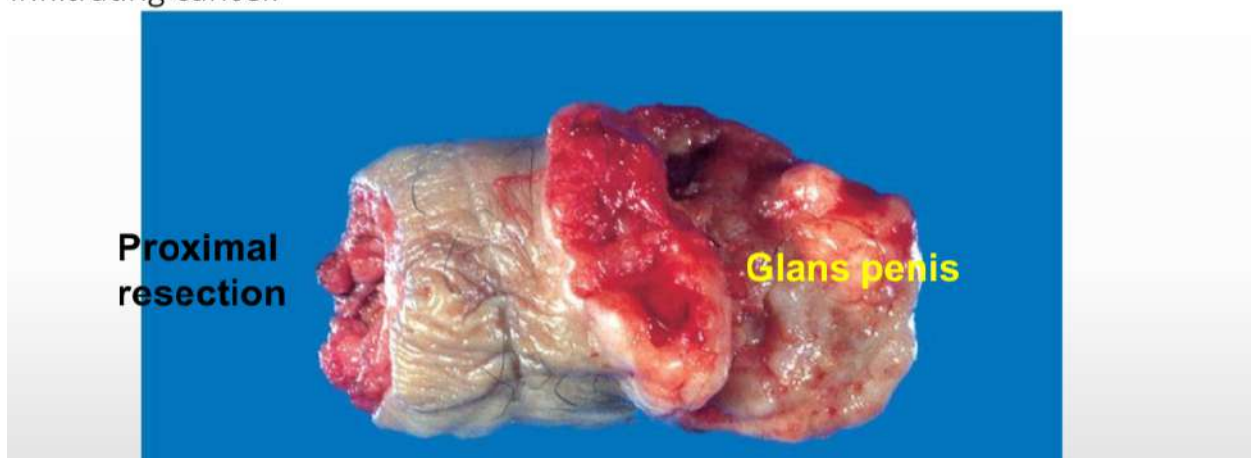
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Penile SCC could be ulcerative or fungal mass on glans or prepuce that invade the BM reaching connective tissue

## Penile Squamous cell ca

- ❑ Penis SCC appears as a **gray, crusted, papular** lesion, most commonly on the glans penis or prepuce.
- ❑ \* It may infiltrate the underlying connective tissue producing an **indurated ulcer** with irregular margins
- ❑ Histopathology , it is usually an **infiltrating keratinizing SCC**.
- ❑ Verrucous carcinoma is a variant of SCC characterized by a papillary architecture, less striking cytological atypia, & rounded, pushing deep margins.
- ❑ Most cases of SCC of the penis are **indolent**, locally infiltrative lesions. **ال كويس course**
- ❑ **Regional inguinal LN** metastases are present in **25%** of patients at the time of diagnosis.
- ❑ Distant metastases are relatively **uncommon**, & the overall 5-year survival rate averages 70%. **Good prognosis**

**Carcinoma of the penis.** The glans penis is deformed by a firm, ulcerated & infiltrating cancer.



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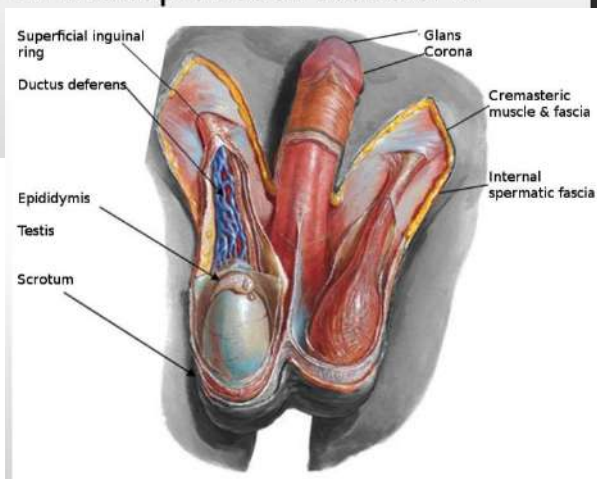




# GENITOURINARY SYSTEM

## SCROTUM

- ❖ Scrotum. The bag of skin that holds and helps to protect the testicles.
- ❖ The testicles make sperm and, to do this, the temperature of the testicles needs to be cooler than the inside of the body. This is why the scrotum is located outside of the body.
- ❖ Testicle. Each testicle produces hormones, the main one being testosterone, with the help of parts of the brain like the hypothalamus and pituitary gland. ...
- ❖ Epididymis. An epididymis is located on the top of each testicle. ...
- ❖ Spermatic cord. ...
- ❖ Cremaster muscle.



اقرأوا الصور كويس  
بعدها انزلوا اقرأوا

## HYDROCELE

\* FLUID ACCUMULATION between VISCERAL & PARIETAL LAYER of the TUNICA VAGINALIS of TESTIS

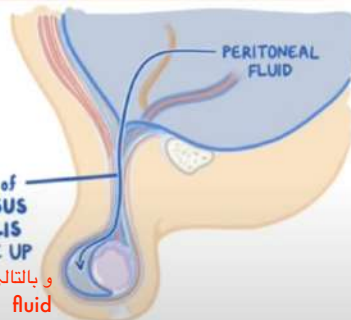
\* on EITHER SIDE

\* CONGENITAL or ACQUIRED



- MOST CASES of CONGENITAL HYDROCELE RESOLVE SPONTANEOUSLY within 1<sup>ST</sup> yr of AGE

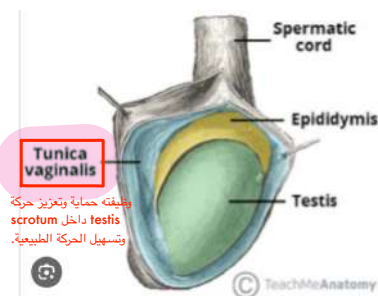
CONGENITAL is typically COMMUNICATING



FAILURE of PROCESSUS VAGINALIS to CLOSE UP

و بالتالي ال fluid رح ينزل لل scrotum

Tunica vaginalis is the serous covering of the testis. It is a pouch of serous membrane, derived from the saccus vaginalis of the peritoneum



وتسهل الحركة الطبيعية. scrotum داخل testis

وتسهل الحركة الطبيعية. scrotum داخل testis


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## HYDROCELE

**\* SOFT, FLUCTUANT, NON-TENDER FULLNESS in SCROTUM**



**TREATMENT**  
**\* RESOLVE on OWN**


**COMPLICATIONS**

- ~ TRANSFORMATION into a **HEMATOCELE** (★)
  - ↳ COLLECTION of BLOOD in SCROTUM \*
- ~ CALCIFICATION
- ~ TESTICULAR ATROPHY

**DIAGNOSIS**

- ~ SCROTUM DOES **TRANSILLUMINATE** (★)
- ~ **ULTRASOUND**
  - ↳ ANECHOIC or ECHOLUCENT MASS around TESTIS

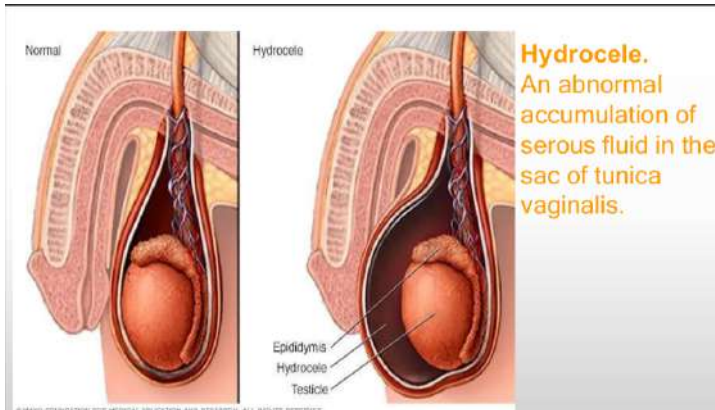
*To distinguish Hydrocele from to the circular mass*



★ The most common cause of scrotal enlargement is: ★

- ❑ **Hydrocele** an accumulation of serous fluid within the tunica vaginalis, which can be idiopathic or arise in response to neighboring infections or tumors; A hydrocele must be distinguished from a true testicular mass, and transillumination may help, because the hydrocele will transilluminate but a testicular mass will be opaque.  
less common causes of scrotal enlargement are:

- ❑ Accumulation of blood (**Hematocele**) or lymphatic fluid (**chylocele**) within the tunica vaginalis **torsion in** نتيجة تعرض ل **trauma** او **testis**



- large hydrocele of the testis. Such hydroceles are fairly common, though most do not reach this size.
- Clear fluid accumulates in a sac of tunica vaginalis lined by a serosa.
- It is a remnant of the embryologic processus vaginalis.
- It may arise in association with a variety of inflammatory and neoplastic conditions.
- A hydrocele must be distinguished from a true testicular mass, and transillumination may help, because the hydrocele will transilluminate but a testicular mass will be opaque.

وقل رب زدني علماً

**Testis** ال  
في حالة ال **Hydrocel** بتكون شفافة عكس مثلاً **testicle** لما يكون في كاسر او كتلة في ال **opaque** بتكون



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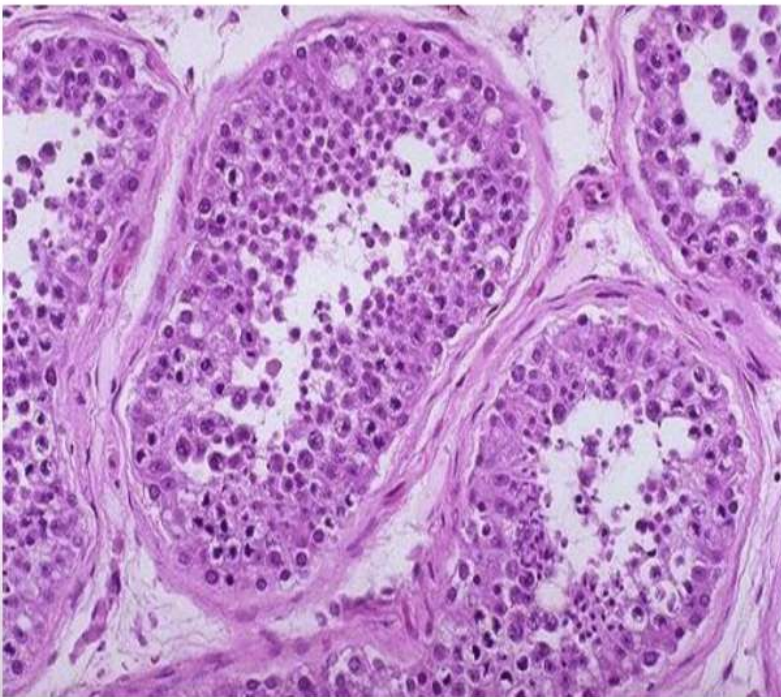
## TESTIS & EPIDIDYMIS

☐ Testicular diseases may be

- Congenital
- Inflammatory,
- Neoplastic.

They may manifest themselves as

- infertility, • atrophy, • enlargement, & • local pain.
- Cryptorchidism & Testicular Atrophy.



- This is the microscopic appearance of **the normal testis**.
- The seminiferous tubules have numerous germ cells. Sertoli cells, with cytoplasm that extends between the germ cells, are inconspicuous.
- Small dark oblong spermatozoa are seen toward the center of the tubules.



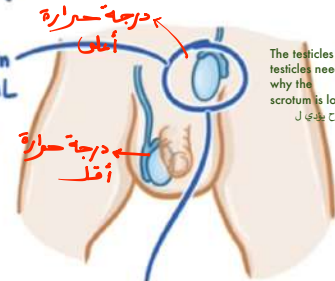
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## CRYPTORCHIDISM

- \* ONE or BOTH TESTICLES FAIL to DESCEND into SCROTUM
- \* PREMATURE BABIES
- \* FERTILITY ISSUES

★ HIGH YIELD

STUCK in INGUINAL CANAL



The testicles make sperm and, to do this, the temperature of the testicles needs to be cooler than the inside of the body. This is why the scrotum is located outside of the body.  
 إذا ال both testis ما طلعت برا الجسم او حتى one of them رح يودي ل Cryptorchidism

- ~ ↑ TEMPS AFFECT SERTOLI CELLS (SECRETE TESTOSTERONE in response to FSH)
- ~ ↑ TEMPS may not AFFECT LEYDIG CELLS as much (SECRETE TESTOSTERONE in response to LH)

★ HIGH YIELD

REMAIN at BODY TEMP

↓ IMPAIR SPERMATOGENESIS

188

★ HIGH YIELD

- \* NORMAL LEVELS of TESTOSTERONE
  - ↳ ESPECIALLY when UNILATERAL \*
  - ↳ LEVELS are typically ↓ in BILATERAL

## CRYPTORCHIDISM

### DIAGNOSIS

- \* UNDESCENDED TESTES PALPATED OUTSIDE of SCROTUM



- \* ↑ LEVELS of FSH & LH
- \* ↓ INHIBIN B
- \* TESTOSTERONE only ↓ in BILATERAL CRYPTORCHIDISM, NORMAL in UNILATERAL CASES

★ HIGH YIELD

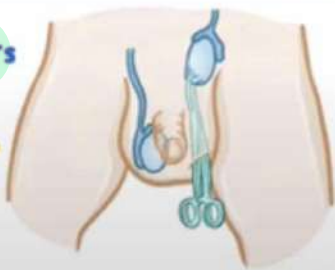


### TREATMENT

~ PERFORMED before 2 yrs to PREVENT COMPLICATIONS

- ↳ INFERTILITY
- ↳ TESTICULAR TORSION
- ↳ TESTICULAR TUMORS (SEMINOMA)

★ HIGH YIELD



- \* usually NOT REQUIRED
  - ↳ TEND to DESCEND by 6 mo
- \* if TESTES don't DESCEND by 2 yrs, SURGICAL REPOSITIONING w/ ORCHIDOPEXY.

★ HIGH YIELD

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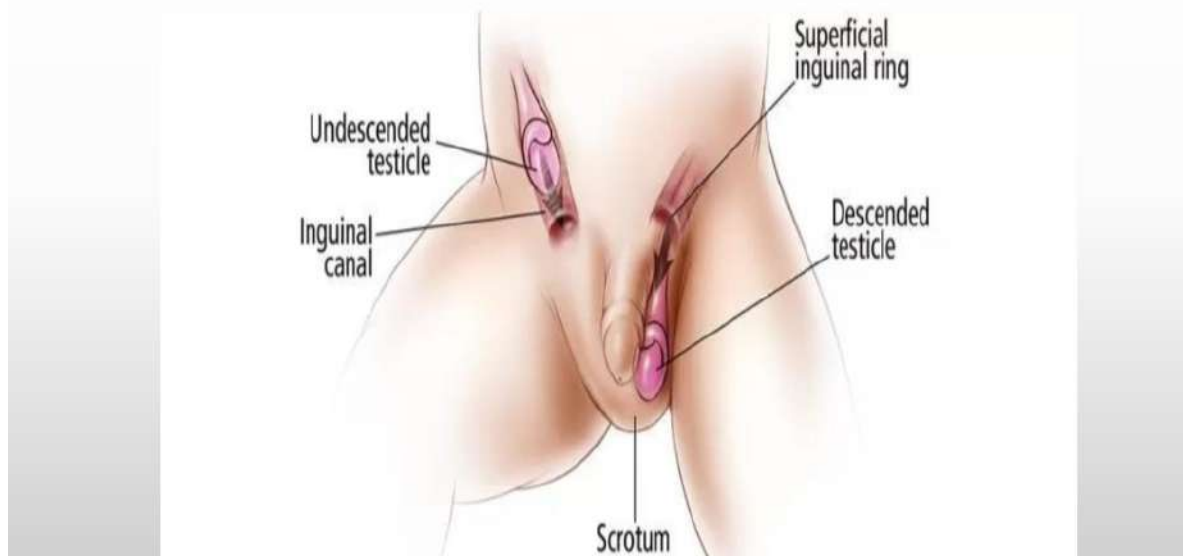
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## Cryptorchidism is failure of testicular descent into the scrotum

- ❑ **Normally, the testes** descend from the coelomic cavity into the pelvis by the 3rd month of gestation & then through the inguinal canals **into the scrotum during the last 2 months of intrauterine life.**  
Because complete testicular descent into the scrotum is not always present at birth, the diagnosis of cryptorchidism is difficult to establish with certainty before 1 year of age, particularly in premature infants,
- ❑ **By 1 year of age: Cryptorchidism is present in 1% of the male population**
- ❑ **Approximately 10% of these cases are bilateral.**
- ❑ In the **vast majority, the cause** of the cryptorchidism is **unknown!**
- ❑ Rarely, **hormonal abnormalities, intrinsic testicular abnormalities, & mechanical** problems, may interfere with normal testicular descent, resulting in malpositioning of the gonad.



**Undescended testis (Cryptorchidism).** The testis is situated within the commencement of the inguinal canal at the pelvic brim.



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## Effects of cryptorchidism

(I) Bilateral cryptorchidism causes **sterility** <sup>عقم</sup> or **testosterone** مافى كمية قليلة جدا

(I) Unilateral cryptorchidism may be associated with **atrophy of the contralateral descended gonad** & may also lead to sterility.

(II) associated with a **3-to 5-fold increase risk of testicular cancer.**



The opposite testicle may experience atrophy or shrinkage due to hormonal imbalances and changes in the environment within the body. When one testicle is retained in the abdomen or inguinal canal it may disrupt the normal hormonal balance and blood flow to both testicles

و بالتالي يؤدي هاد الاختلال إلى تقليل الوظيفة والحجم لل testicle اللي نزلت بشكل طبيعي

- ❑ Individuals with unilateral cryptorchidism are also **at increase risk for the development of cancer in the contralateral normally descended testis**, suggesting that **some intrinsic abnormality**, rather than simple failure of descent, may be responsible for the increase risk.
- ❑ Surgical placement of the undescended testis into the scrotum (orchiopexy) **before puberty** decrease the likelihood of testicular atrophy & reduces (but does not eliminate) the risk of cancer & infertility.

## Morphology

- ❑ Cryptorchidism involves the **right testis** somewhat more commonly than the left.
- ❑ In **10% of cases**, the condition is **bilateral**.
- ❑ The cryptorchid testis may be of normal size early in life, although some degree of atrophy is usually present by the time of puberty.



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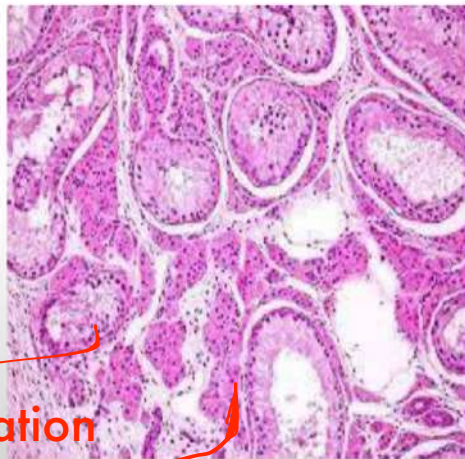
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## ❖ Histologically (حفظ)

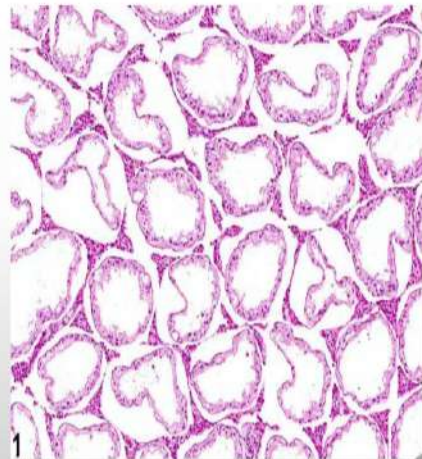
- cryptorchid testes show evidence of
  - (1) tubular atrophy by 5 to 6 years of age, hyalinization is present by the time of puberty,
  - (2) accompanied by Leydig cell hyperplasia ↗ **Between seminiferous tubules**
  - (3) foci of intratubular germ cell neoplasia **may be present in cryptorchid testes & may be the source of subsequent testicular cancers.**



Atrophic Testis in both pictures



**Hyalinization**




Sertoli cells **فقدت ال**

**No Spermatogenesis**

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- ❑ Similar **tubular atrophy** may be caused by several other conditions, including حفظ ☹️
  - Chronic ischemia. **trauma** ممكن بسبب
  - Trauma.
  - Chronic hyperestrogenism (e.g., cirrhosis)
  - Radiation
  - Anti-neoplastic chemotherapy. 

مشان هيك الذكور الصغار بالعمر اللي  
بعدهم مو متزوجين اللي بنصابوا  
بالكانسر باخدوا الاطباء منهم عينات من  
الحيوانات المنوية وجمدوها للمستقبل لانه  
ال **chemotherapy** بعمل **infertility**





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## Inflammatory lesions

- ❑ Inflammatory lesions of the testis are more common in the epididymis than in the testis proper.
- ❑ Some of these are associated with STD (venereal) disease. Other causes of testicular inflammation include nonspecific epididymitis & orchitis, mumps, & tuberculosis.

(I) **Nonspecific epididymitis & orchitis**, begin usually as a **primary UTI** with secondary ascending infection to the testis through the vas deferens or lymphatics of the spermatic cord. The involved testis is typically **swollen, tender** & contains a predominantly neutrophilic cell infiltrate.

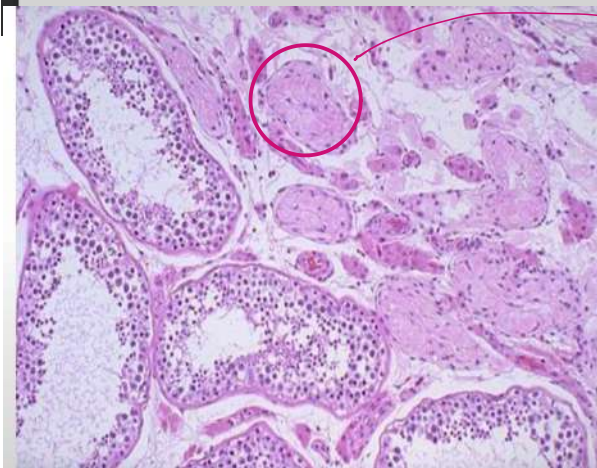


(II) **Orchitis complicates mumps infection** in roughly **20%** of infected **adult males** but rarely occurs in children.

- The affected testis is **edematous & congested** & contains a predominantly lymphoplasmacytic cell infiltrate. Some cases associated with atrophy, fibrosis, & **sterility**.

(III) **Granulomatous inflammation** of the testis may be caused by some infections & autoimmune disease, of which **TB is the most common**. Testicular TB generally 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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8. A 24-year-old man presents for his annual physical and is noted to have a nontender right testicular nodule. After an initial ultrasound, he is sent for CT imaging of his abdomen and pelvis, which shows enlarged para-aortic lymph nodes that are greater on the right side. What testicular pathology does this patient most likely have?

- (A) Epididymitis
- (B) Leydig cell tumor
- (C) Seminoma
- (D) Testicular torsion

## Answer

8. The correct answer is C. Testicular cancer is most often diagnosed in men who are between 15 and 35 years old, and seminomas are the most common type, accounting for approximately 40% of testicular cancers. The lymphatic spread of testicular cancers is often seen in the paraaortic chain of lymph nodes.

Answer A is incorrect. Epididymitis is an inflammation of the epididymis, which is posterior to the testis. This condition would be painful, and it is unlikely to have grossly evident lymphadenopathy in the para-aortic chain.

Answer B is incorrect. A Leydig cell tumor is a form of testicular cancer, but it is much less common than the seminoma.

Answer D is incorrect. Testicular torsion is a urologic emergency, and it would present with acute, high-intensity pain as a result of ischemia.

## Question 3

A 35-year-old man goes to his physician for a routine examination. On physical examination there is a left inguinal mass. The right testis is palpated in the scrotum and is of normal size, but a left testis cannot be palpated in the scrotum. An ultrasound scan shows that there is a 2 cm solid inguinal mass. Which of the following approaches is most appropriate to deal with this patient's testicular abnormality?

- A  Put the mass into the scrotum surgically
- B  Remove the mass along with the opposite testis
- C  Remove the mass
- D  Put the patient on testosterone therapy
- E  Put the patient on chemotherapy

## Answer

(C) CORRECT. A cryptorchid testis that is not treated in early childhood no longer functions in spermatogenesis and presents a risk for subsequent development of carcinoma. The earlier in life that an orchidopexy is performed, generally under the age of 5, the more likely the testis will function properly. If the opposite testis were also cryptorchid, it would be at increased risk for development of carcinoma. However, the risk of carcinoma in the descended testis is unlikely to be increased, so it can be left to function. The patient may opt for orchidopexy of the cryptorchid testis, but it can be explained that fertility and hormone production can be provided by the descended testis. If the patient wishes "two balls" in the scrotum, a prosthesis could be placed.

## Question 9

A 19-year-old university student notes the sudden onset of severe discomfort in his scrotum late one evening. No position is comfortable for him to sit or lie down. Aspirin and beer have no effect. He has a friend drive him to the emergency room. On physical examination his vital signs include temperature 37°C, respirations 22/minute, pulse 80/minute, and blood pressure 100/65 mm Hg. His left testis is slightly enlarged and exquisitely tender. There is no inguinal adenopathy. A doppler ultrasound scan shows decreased blood flow in the left testis. Which of the following conditions is he most likely to have?

- A  Choriocarcinoma
- B  Varicocele
- C  Lithiasis
- D  Torsion
- E  Hydrocele

## Answer

(D) CORRECT. Testicular torsion often has a sudden onset and you must recognize this condition, because if it must be treated immediately, for the lack of blood flow can lead to hemorrhagic infarction. An ultrasound can be used to help identify this condition, demonstrating lack of blood flow.

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## Question 10

A 20-year-old man has noted a penile discharge with some pain on urination for the last 2 days. On physical examination there is a small amount of whitish exudate that can be expressed from the urethral meatus. Laboratory studies with culture of the penile discharge reveal *Neisseria gonorrhoeae*. If untreated, which of the following complications is he most likely to develop as a consequence of his disease?

- A  Aortitis
- B  Balanitis
- C  Epididymitis
- D  Orchitis
- E  Sacroiliitis

## Answer

(C) CORRECT. When the testis is involved by gonorrhea, it is typically the epididymis. Many male gonorrheal infections are asymptomatic and not followed by significant complications. Urethritis with stricture is a possible complication.

## Question 18

A study is conducted to document testicular abnormalities in adult male patients with no major medical problems who had biopsies performed for infertility workups. In some of these cases, the patients have normal sized testes but microscopic examination showing a patchy pattern of atrophy of testicular tubules. Which of the following infections is most likely to produce the findings seen in these men?

- A  Human papillomavirus
- B  *Chlamydia trachomatis*
- C  *Neisseria gonorrhoeae*
- D  Mumps virus
- E  Herpes simplex virus

## Answer

(D) CORRECT. This is a very common childhood infection (when vaccinations are not done) resulting in orchitis as well as parotitis. The inflammation rarely causes enough damage to produce a significantly reduced sperm count, if a childhood infection. The virus tends to produce more testicular damage when adults are infected.

## Question 20

A 40-year-old man has noted gradual enlargement of his scrotum, more on the right side, for the past 2 years. There is no associated pain, but the size is becoming uncomfortable. Physical examination reveals that the right side of the scrotum is enlarged to three times the size of the testis palpable on the left. This mass transilluminates. There is no tenderness on palpation. There is no inguinal lymphadenopathy. An ultrasound reveals a 5 cm thin-walled cystic fluid-filled area in the region of the right testis. Which of the following is the most likely diagnosis?

- A  Seminoma
- B  Torsion
- C  Hydrocele
- D  Varicocele
- E  Orchitis

## Answer

(C) CORRECT. A hydrocele is just a fluid filled sac that gradually enlarges. It represents fluid collection between the parietal and visceral layers of the tunica vaginalis. If congenital, it is the result of failure of the processus vaginalis to obliterate.

كل التوفيق  

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