

Wednesday 28/2/2018

Scrotal and Testicular Abnormalities**Anatomy**

The scrotum is a capacious structure that contains the testes and epididymes. Beneath the skin, from superficial to deep, are the dartos, external spermatic, cremasteric, and internal spermatic fascias. Beneath the internal fascia are the parietal and visceral layers of the tunica vaginalis. The testis' noncompliant outer layer is the tunica albuginea. Inside the tunica are the seminiferous tubules. The blood supply enters the testis at the superior pole by way of the spermatic cord.

In addition to the vas deferens, the cord carries three separate sources of arterial blood flow—the testicular artery that branches from the aorta below the renal artery, the cremasteric artery, and the deferential artery.

The veins draining the testis and the epididymis form the pampiniform plexus. The veins become fewer as they traverse the inguinal canal and at or near the inguinal ring they join to form one or two testicular veins, which pass upwards behind the peritoneum. The left testicular vein empties into the left renal vein, the right into the inferior vena cava below the right renal vein. The testicular veins may have valves near their terminations, but these are often absent.

The testes develop in the retroperitoneum below the kidneys in early fetal life. The processus vaginalis starts as a dimple of peritoneum and precedes the testis in its journey through the abdominal wall down to the scrotum. The fully developed gubernaculum is a ligament extending from the processus vaginalis down to the bottom of the scrotum, the final destination where the testes will settle after its descent. It works as a guide for the descending testes and it contains muscle fibers.

Empty Scrotum:

Absent scrotal contents, usually unilateral. The condition may be due to:

1. Undescended testis.
2. Retractable testis
3. Ectopic testis.
4. Absent testis.
5. Orchidectomy.

Ectopic Testis:

The testis is located at an abnormal position outside the normal descent pathway.

The sites of ectopic testis are:

- At the superficial inguinal ring;
- In the perineum;
- At the root of the penis;
- In the femoral triangle.

An ectopic testis is usually fully developed. The main hazard is liability to injury.

Absent Testis:

Vanishing testis describes a condition in which a testis develops but disappears before birth. The most likely cause for this is prenatal torsion. True agenesis of the testis is rarer. Laparoscopy is useful in distinguishing these causes of clinically absent testis from intra-abdominal maldescent.

Varicocele:

A varicocele is a dilatation of the veins draining the testis.

→ Aetiology: Most varicoceles are idiopathic in aetiology. Incompetent valve veins may be responsible. Metabolic products from the adrenal vein are sometimes claimed to be a cause.

A varicocele may develop secondary to retroperitoneal compression of the testicular vein as in renal tumors or after nephrectomy.

Clinical Features: Most varicoceles present in adolescence or early adulthood and they are mostly found on the left side.

Varicocele is usually symptomless but there may be an annoying dragging discomfort. The scrotum on the affected side hangs lower than normal. In advanced cases, palpation of the scrotum gives a feel of "bag of worms" which disappear on lying position.

In longstanding cases the affected testis is smaller due to atrophy. Advanced cases of varicoceles may impair fertility.

Management: Asymptomatic varicoceles need no treatment. Operation "varicocelectomy" may be indicated in the presence of testicular atrophy especially in adolescence and early adulthood. Pain that is troublesome to the patient is another indication for treatment. Probably the most common indication of varicocelectomy is the hypofertility.

The operation can be performed surgically or laparoscopically. Embolization of the vein can also be performed. Recurrence is common due to the plentiful collateral circulation between the veins draining the testes.

Rupture of The Testis:

Rupture by a blow is uncommon because of the testis's mobility within the scrotum. Contusion and rupture are associated with a collection of blood around the testis and cannot usually be distinguished with certainty without exploration. The haematocoele should be drained and the tunica albuginea repaired after evacuation of haematoma. A severely damaged testis may have to be removed.

Hydrocele:

A hydrocele is an abnormal fluid collection within the tunica vaginalis of the scrotum or along the spermatic cord. Hydroceles are classified into:

1. Congenital hydrocele.
2. Acquired hydrocele: this may be further classified into:
 - a. Primary or idiopathic.
 - b. Secondary or testicular.

Aetiology:

1. Excessive production of fluid within the sac, e.g. secondary hydrocele;
2. Defective absorption of fluid; most primary hydroceles
3. Interference with lymphatic drainage of scrotal structures;
4. Connection with the peritoneal cavity via a patent processus vaginalis (congenital).
5. Any testicular abnormality may result in secondary hydrocele.

Clinical Presentation:

Hydrocele usually presents as painless scrotal swelling that may reach a large size prior to presentation. Large hydroceles often cause dragging pain in the scrotum.

On examination, hydroceles are usually non tender, lax or tense according to the amount of fluid in it and it is usually possible to get above it. The testes may be palpable in lax hydrocele, however, in tense hydrocele an ultrasound must be requested to exclude an underlying tumor.

In contrast to hernia, the swelling is not reducible, has no cough impulse and is usually transilluminating.

In congenital hydrocele, there is patent processus vaginalis that allows peritoneal fluid to pass through. This manifests as a changing size scrotal swelling that increases and decreases throughout the day. The fluid may be sequestered in part of the processus vaginalis and present as an oval swelling along the spermatic cord (Encysted hydrocele of the cord). In females it may be found in relation to the round ligament (Hydrocele of the canal of Nuck).

Management:

The definitive management of hydrocele is by surgery. Congenital hydroceles in the first year of life need only reassurance. If they persist later, they are managed by herniotomy (Inguinal approach). Secondary hydroceles are treated by treating the underlying cause.

Aspiration of the hydrocele may be useful for patients unfit for surgery. However, rapid recurrence usually occurs.

Testicular Torsion:

Testicular torsion refers to the twisting of the spermatic cord structures and subsequent loss of the blood supply to the ipsilateral testicle. This is a urological emergency; early diagnosis and treatment are vital to save the testicle and preserve future fertility.

Clinical Presentation:

Testicular torsion is most common between 10 and 25 years of age although a few cases occur in infancy. Symptoms vary with the degree of torsion. Most commonly there is sudden agonising pain in the groin and the lower abdomen. The patient feels nauseated and may vomit.

Examination reveals the affected testes higher than the other and usually in a transverse lie (Angel's sign). An edematous cord may be felt with a knot in it. The cremasteric reflex is almost always absent. Elevation of the testes will aggravate the pain (Prehn's sign).

GUE is usually normal and Doppler ultrasonography of the scrotum will confirm the decreased or absent vascularity in the testes.

Management:

This should be prompt as time is important to prevent testicular loss. Delays should not be made even waiting for Doppler U/S. Suspicious cases should also be explored.

Surgery entails untwisting of the testes and subsequent fixation (Orchiopexy) to prevent recurrent condition. The other testes should also be fixed because the anatomical defect is likely to be bilateral. If, at exploration, the testes was found to be gangrenous then removal (orchietomy) should be performed.

If the patient presents in the first hour or so, manual untwisting may be tried then arranging for operative fixation of both testes.

Epididymo-orchitis:

Inflammation of the testes and epididimys. The infection reaches through a retrograde manner from the urethra. Patients with bladder outflow obstruction are more likely affected. The most common organisms are chlamydia. Gonococci are also common. Blood-borne infection is less likely to occur and suspected when there is E.coli, streptococcal or staph infection in the absence of associated urinary infection.

Acute epididymo-orchitis may follow urinary tract instrumentation or surgery especially open prostatectomy.

Clinical Features:

There is usually a history of urinary symptoms followed by fever and a gradually increasing pain and swelling in the scrotum.

The scrotal skin is red and shiny and usually adherent to underlying testes. The testes and epididymis are tender and swollen. Elevation of the testes will cause some relief of pain.

Mumps viral infection may also cause orchitis which sometimes causes testicular atrophy.

Management:

Treatment is with broad spectrum antibiotics that should be continued for 2 weeks or until inflammation has subsided. Supportive measures include analgesia and antipyretics with increasing fluid intake. Local measures may help by testicular elevation.

➔ A testicular abscess may develop as a complication and this needs drainage.

Chronic Epididymo-orchitis:

➔ Usually insidious in onset with mild ache and swelling. It is usually tuberculous in origin. Management of the primary TB causes resolution of the genital disease.

➔ Urethral stricture may be a cause of recurrent, or persistent, epididymo-orchitis.

Testicular Tumors:

Testicular tumors are one of the most common tumors in men. Most are malignant. Testicular maldescent predisposes to tumor even after restoration into the scrotum. Testicular tumor may sometimes first present with metastasis. ←

Pathology:

Testicular tumors are classified, according to the predominant cell type, into:

- ① Seminoma (40%). Derived from seminiferous tubules. Peak age 35 - 45 years. Metastasize via lymphatics to retroperitoneal nodes. Hematogenous metastasis is uncommon.
- ② Teratoma (32%). Peak age is 20 - 35 years
- ③ Mixed seminoma and teratoma (14%).
- ④ Interstitial tumors (1.5%). Arise from Leydig and Sertoli cells.
- ⑤ Lymphoma (7%)
- ⑥ Other tumors (5.5%)

Clinical Features:

Testicular tumors usually present with a lump that is usually painless. Larger lumps may cause dragging sensation or pain. A recent trauma may pay attention to the lump.

On examination, the testes is enlarged, smooth and firm. A secondary hydrocele may be present. The epididymis may be difficult to distinguish.

Secondary deposits in the retroperitoneal nodes may be palpable.

Sometimes the patient may present with symptoms of metastasis, eg, abdominal pain, backache or hemoptysis.

Staging:

- Stage 1 testes lesion only, no spread
- Stage 2 nodes below the diaphragm only
- Stage 3 nodes above the diaphragm
- Stage 4 pulmonary or hepatic metastasis

Investigations and Management:

Imaging is important in the assessment of testicular tumors. Tumor marker are used for diagnosis and follow up after treatment.

The first step in the management is radical inguinal orchidectomy which will remove the tumor and gives a specimen for histopathologic assessment that will guide further treatment.

Seminomas are sensitive to adjuvant radiotherapy and cisplatin. Teratoma is less radiosensitive and chemotherapy may be used as adjuvant therapy. Retroperitoneal lymph node dissection (RPLND) may be needed when retroperitoneal masses remain after chemotherapy.

Prognosis depends on the histological type and the presence or absence of metastasis.

Fournier's Gangrene:

Fournier's gangrene (FG) is an acute, rapidly progressive and potentially fatal, infective necrotizing fasciitis affecting the external genitalia, perineal or peri-anal regions. The corpora, urethra, testes, and cord structures are usually not involved in Fournier's gangrene, while the superficial and deep fascia and the skin are destroyed. Management

is by extensive necrotic tissue debridement with broad spectrum antibiotics and frequent dressing.

Other causes of Scrotal Swellings:

- ① Torsion of testicular or epididymal appendages
- ② Hematoma, hematocele
- ③ Idiopathic scrotal edema
- ④ Sebaceous cyst
- ⑤ Epididymal cyst
- ⑥ spermatocele

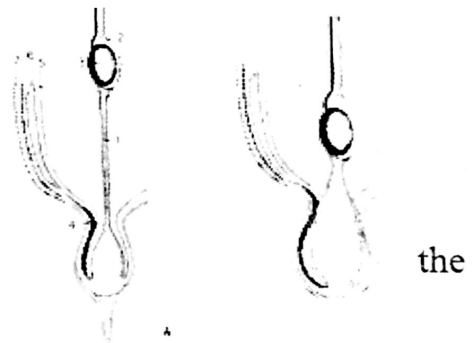
Testicular Maldescent:

This is a condition in which the testis is not present in its normal position in the bottom of the hemiscrotum due to incomplete or defective descent.

Overview: The testes are retroperitoneal structures in the fetal life descend gradually to reach their normal position at birth. The gubernaculum is a ligamentous structure that function as guideway for the descent under hormonal effect. Defects in the descent process results in testicular maldescent.

Undescended Testis (Cryptorchidism):

This occurs when there is arrest in the descent through the normal pathway. It is relatively common condition. The testis stops at a point higher than its supposed location. In some cases, the testis descend in first year of life.



The condition is more common on the right and may be bilateral in 20% of cases.

The location of the testis may be:

- a. Intra-abdominal
- b. Intra-canalicular: in the inguinal canal.
- c. Extra-canalicular: just outside the external inguinal ring or at the neck of the scrotum.

Undescended testis has abnormal microscopic appearance making it liable for future complications.

Sequelae:

1. Impaired fertility (Hypofertility): The risk is higher in bilateral cases. Studies report that the risk is intrinsic in the testis, i.e., restoration into the scrotum may not restore normal fertility.
2. Malignant transformation: The cancer risk is 5 – 10 times higher than normal people. It is unclear whether early treatment reduces the malignant risk. However, it definitely makes tumor identification easier than intra-abdominal location.
3. Hernia: Risk of hernia is higher because 90% of cases has patent processus vaginalis.
4. Testicular Torsion: A cryptorchid testis is more liable for torsion as a consequence of developmental abnormality.

Clinical Features: In a child with undescended testis, the ipsilateral hemiscrotum is underdeveloped, smaller in size and with minimal skin rugae. The testis cannot be restored to the bottom of scrotum without tension. The testis may be palpable in the inguinal region.

Ultrasound helps to detect impalpable testis. MRI or laparoscopy may be needed for intra-abdominal testis.

1) Differential Diagnosis: Empty scrotum may be due to the following..

- a. Mal descended testis
- b. Retractile testis: During childhood, the testes are mobile and the cremasteric reflex is active. Thus any stimulation near the scrotum may result in testicular elevation. In this condition the scrotum is sizeable and well developed. The testis can be milked down into the scrotum without tension.
- c. Vanishing Testis (True absent testis): This may be due to failure of testicular development. More likely, it is due to intra-uterine torsion followed by degeneration.
- d. Orchidectomy.
- e. Ectopic Testis: In this condition, the gubernaculum leads the testis into an abnormal position, usually in the superficial inguinal pouch.

Treatment: Restoration of the testis into normal position (Orchiopexy) is usually performed in the first year of life to prevent the already mentioned testicular complications. The testis is put into a sub-dartos pouch in the scrotum for fixation. Sometimes for a high undescended testis, a two stage operation may be needed.

